

# PACIFIC DISCOVERY



FIFTY CENTS

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WITH THE LAST ISSUE of the eighth volume of *Pacific Discovery* in press, and the next year in planning, the time is right for looking ahead. The editors are never quite satisfied with the status quo — the ceaseless nagging of an unattained ideal is the endemic plague of editors, it seems. The symptoms are a fever of hope

## PRE-DISCOVERY

for the bigger and better, next year, and a rash of plans to achieve the same. There is no cure, short of getting out of the publishing business; but the reader can help the editor live with his disease by the application of that therapeutic aid, now medically recognized, known as T.L.C. (Tender Loving Care). This is best administered to editors in the form of communication—from the reader to the editor. This does not mean he wants only bouquets. Any communication is good medicine! Particularly welcome are suggestions for improvement, ideas for other kinds of material some appreciable number of readers might like to see — we may be overlooking some good bets — and reaction to such matters we deal with as may be considered controversial. A department we want to keep going is the Information Desk — and we don't want to rig the questions ourselves! Come, Gentle Reader, to fill the prescription of T.L.C. We need it. The contact will enable us, in turn, to feel *your* pulse.

THE LATE **Leslie L. Haskin's** account of "glass shells," as he poetically termed the quite utilitarian net floats collectors prize, came to us with the following letter: "You are probably familiar with the work of the late Leslie Haskin, journalist and naturalist, whose *Oregon Wildflowers* is the hornbook for amateur botanists

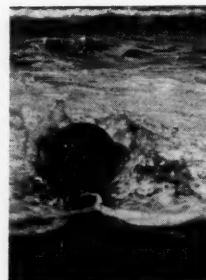
## PD'S AUTHORS

in these parts. During his last years he lived at Newport, Oregon, on the coast, where I was then publisher of the newspaper. He gave considerable time to a story of the Japanese fish-net floats, which as you know are a common sight in homes and yards and patios all along the Pacific. Enclosed is a manuscript on that subject which his sister recently found among his things. . . ." The writer is Monroe Sweetland, publisher of the Portland *Oregon Democrat*. Leslie Haskin's sister is Mrs. Alma Parrish of Scio, Oregon. We are grateful to both Mr. Sweetland and Mrs. Parrish for the opportunity to publish this unique contribution on a subject of interest to a great many Pacific Coast people, and to Lou Ernst and Tony Cincotta of San Francisco's famous Fisherman's Wharf, and various Owens-Illinois people in San Francisco and Oakland for additional information and helpfulness. . . . ¶ A few words about **Anne J. Alexander** of Natal, South Africa, are included in the caption on page 11. For the appearance here of her original contribution to biological knowledge, *PD* is fully indebted to Dr. Raymond B. Cowles, Department of Zoology, U.C.L.A. . . . ¶ The well known bird photographer of Los Angeles, **Don Bleitz**, has been a frequent *PD* contributor. He and Mrs. Bleitz have established the Bleitz Wildlife Foundation for conservation purposes. . . . ¶ **Philip Ferry**, San Francisco writer and traveler, returns to our pages with an article for which he acknowledges the help and inspiration of Lowell Sumner and L. Floyd Keller of the National Park Service. . . . ¶ A resident of Seattle, **George Durham** has attended Columbia University Library School, held a county librarianship in Washington, and is at present "beginning work towards a Ph.D. in the History Department of the University of Washington." . . . ¶ Co-conductor of *PD's* popular Astronomy Department, **Leon E. Salanave** is now filling his time, between writing articles and lecturing at the Morrison Planetarium, in long-range preparation for an Academy eclipse expedition to the South Pacific — in 1958! Such is the time sense of astronomers. D.G.K.

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THE COVER

THE VIEW of a 14-inch Japanese net float landing on San Francisco's beach is strictly nature-faked. Glass ball courtesy of Cincotta Bros., San Francisco. Photo by Toshio Asaeda. (See page 4.)

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## "Echo Park Won't Drown After All"

*is the title under which the following editorial appeared in the San Francisco Chronicle for 6 November 1955. In calling the gentlemen of the press in their far-from-ivory tower on Mission Street to ask their leave to reprint it, we said they had expressed PD's sentiments perfectly (cf. "Conservation Calls for Coordinated Planning," March-April 1955; "What Does Conservation Mean Today?" and "Danger to Dinosaur," January-February 1954, the latter an article by Harold C. Bradley).*

CONSERVATIONIST forces of the Nation, among them the Sierra Club of California, have won a long, hard battle to save Echo Park in Dinosaur National Monument from being drowned. Their adversaries threw in the towel last week at a meeting in Denver to consider future strategy on the Upper Colorado river storage project.

Congressmen and Senators from Colorado, Utah, New Mexico and Wyoming concluded that the House would never authorize the \$1,500,000,000 Upper Colorado reclamation plan so long as an Echo Park dam was part of it. They cut Echo Park dam from their proposal and expressed confidence that the rest of the Upper Colorado basin scheme would stand its best chance of passage by Congress.

This retreat constitutes recognition of the fact that the American people will fight to keep national parks and monuments from destruction, even when significant material benefits are urged as warranting destruction. Echo Park, at the juncture of the Green and Yampa rivers, some 275 miles northeast of Salt Lake City on the Colorado-Utah border, is a magnificent natural heritage. The fact that not many people now visit it yearly is no argument against preserving it for the enjoyment of the American people in the fast-approaching day of a 200,000,000-and-more population. Even if Echo Park were indispensable as a dam site in the Upper Colorado reclamation system, there would be grave objections to despoiling it. But it is not indispensable; satisfactory alter-

native sites exist, and the willingness of the Upper Colorado project proponents to give up their battle is proof enough that the rest of the scheme can go forward if an alternative dam is built.

Conservationist elements in Congress should now proceed to make sure that Echo Park dam is not merely eliminated from the Upper Colorado basin plans, but that its functions are engineered out and transferred to other dams, so that no possibility will arise of Echo Park's being slipped back into the blueprints unawares.

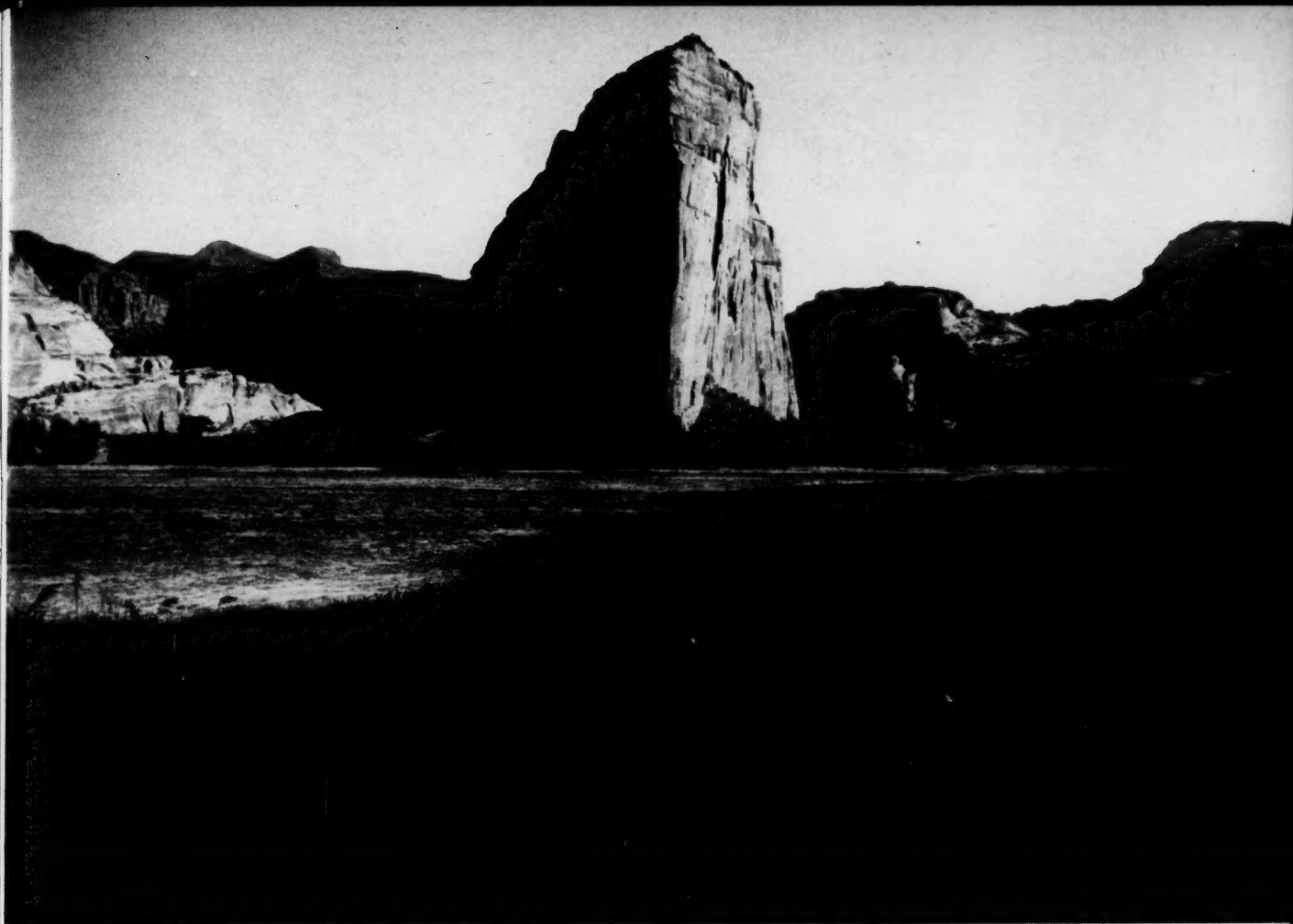
California, as a water-short State, is distinctly in favor of reclamation developments wherever in the West they can be rationally justified. With the Echo Park dam eliminated, the way is cleared for a less controversial reconsideration of the merits and justification of the remainder of the Upper Colorado project. It is of course under heavy attack from the users of Lower Colorado water, chiefly the Southern California users, who fear the impairment of their established rights. The project is also under strong and skeptical attack from many who believe that the cost of water developed for irrigation will be many times any conceivable value of the land benefited; that power will be produced only at fantastically high costs; that as much as \$4,000,000,000 of everybody's taxes will have to be spent for the completion of the plan. These are hard-headed doubts that the Upper Colorado proponents have not yet resolved.

—San Francisco Chronicle

ALL AMERICANS should be thankful that so many of the nation's most influential newspapers—the West's own *San Francisco Chronicle*, and the *New York Times* among them—joined forces editorially with nationwide conservation groups in the fight to save Dinosaur National Monument. In doing this the newspapers rose

splendidly above political partisanship and pressure from the power interests. They sensed that the American people were not about to let the national parks idea go by the board.

It took a major campaign like Dinosaur to alert the public. Everyone knows now that the sanctity of the parks and monuments must never be taken



Steamboat Rock from Echo Park. (Philip Hyde)

for granted. The educational job the conservation organizations did was alone worth the great cost in money and hard work of the Dinosaur victory. This job must go on. Not only the national parks and monuments need our vigilance. Wherever a piece of wild land is left to us, there is a potential threat to its existence, sometimes justifiable, usually not. If every citizen would take it on himself to become familiar with all national, state, and county parks, national and state forests, wilderness areas, wildlife sanctuaries, and other reserves, just within his own radius of week-end travel, find out what exploitative dangers they are open to, and join actively with groups or individuals working to save them — our heritage would be safe.

An example may be found immediately in our desert areas. The chief threats to their future are from mining interests and the armed services. Of course both of these represent the national well-

being. But when the Navy, for instance, wants to take over a major portion of Death Valley National Monument, or when mining concerns want to prospect Joshua Tree National Monument at will, it rests with the public to demand: why is this deemed necessary, and what are the alternatives? There is a tendency on the part of even our respected armed services to justify anything in the name of national security, and the exploiters of fissionable minerals easily tag along behind the same dog. The people must demand that all such claims be fully examined in fair public hearings. And everyone with personal concern for the desert wildernesses can help and learn at the same time by joining the Desert Protective Council. This is done by sending your name and a dollar a year (address: Box 716, Banning, California). Its newsletter *El Paisano*, edited by our contributor Harry James, will keep you informed. D.G.K.



A 12-inch glass float posed on the beach at San Francisco, courtesy of Ray Strong. (Cecil Tose)

## GLOBES OF GLASS: Ocean's best for beachcombers

**LESLIE L.  
HASKIN**

**A** WRITER of marine history was strolling along an east Florida beach when suddenly the flooding tide rolled a shell to his very feet. Nothing strange about that; nothing save the fact that this was a glass "shell" branded with the design of an anchor. A young woman was searching an Oregon shore for shells. Now Oregon beaches are not famous for large or beautiful shells. The woman was becoming discouraged when the toe of her shoe disturbed a shell half buried in the sand — another

glass shell, this one bearing an Oriental character. The librarian of a marine museum in Virginia reports finding a similar glass shell in the Bermudas. In 1936 ethnologists of Dr. Aleš Hrdlička's party seeking evidence of a prehistoric emigration from Asia to America, found eight or ten glass shells on Kiska Island. They are found in the seas of Hammerfest, Europe's most northern city, and were collected as souvenirs by American servicemen on the islands of the South Pacific. From that other



Every enthusiast for these things dreams of seeing one come in, surf-tossed and spinning, from across the ocean. The 14-inch float courtesy Cincotta Bros., San Francisco. (Toshio Asaeda)

island, where Englishmen once ruled the seas, a retired member of their department of Agriculture and Fisheries wrote me proudly, "In my front hall I have a pair of them, each resting on a large, early Victorian, carved mahogany curtain ring."

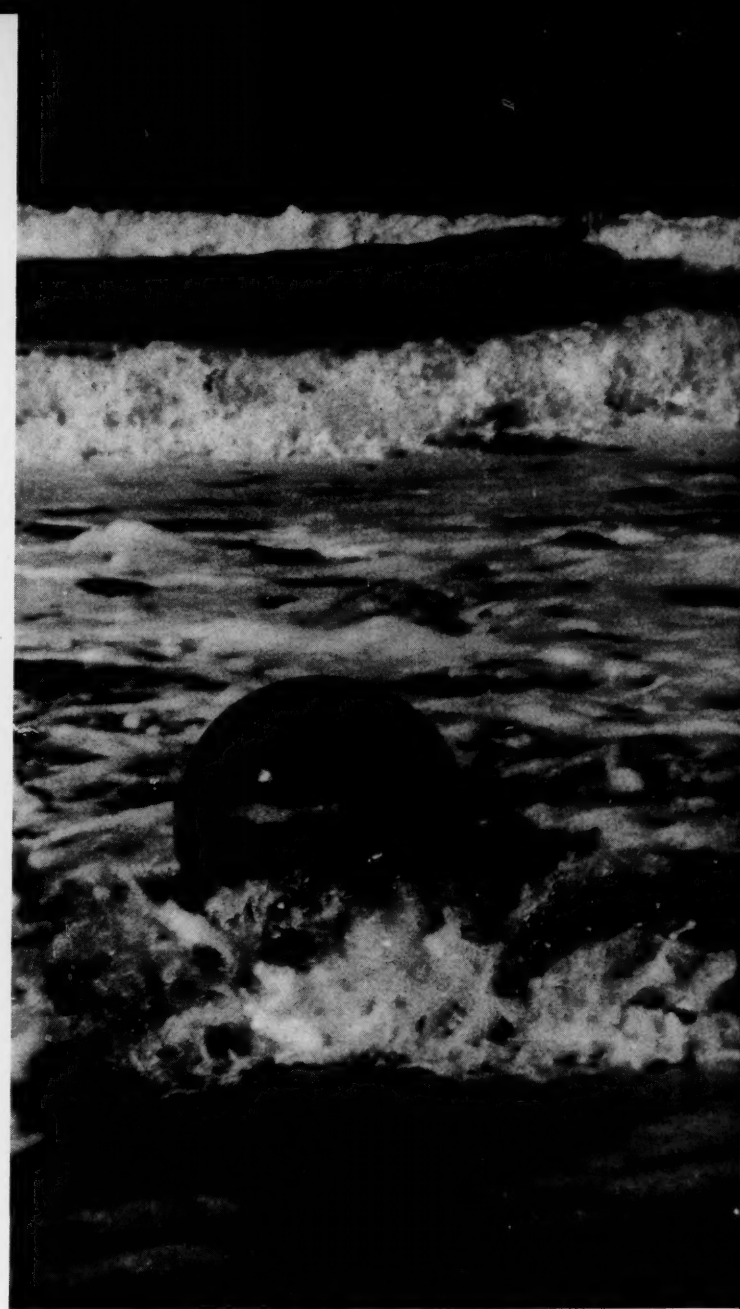
I have called these strange glass objects glass shells. Perhaps glass bubbles would be a better name, or glass balls, though not all are spherical. In truth, they really are bubbles, blown of crude glass, which have been used as floats on fishing nets in many far-separated regions of the world. Storms or accidents have torn them from the nets they once supported, to wander the sea-driven latitudes. They are victims of storms and currents, winds and tides, until they may chance to come to rest on a beach far away.

These glass shells are treasure-trove. Collecting of seashells is a world-wide fad, some counting their specimens by the thousands. Collecting of glass shells, though not so well known, is a hobby with greater scarcity interest. Conchologists have libraries and museums to consult. Glass shells have no organized literature. Fortunate and rare is the collector who can boast of one hundred good specimens. For one to claim that he knows their history means the student has corresponded with experts in a dozen countries and in as many languages.

Collectors find glass shells in a great variety of sizes, shapes, and colors. Sizes range from a scant two inches in diameter to great floating buoys with a circumference of 48 inches or more. Most of them are of crude, bubble-filled glass. The common color is "bottle green," sometimes bluish. More rare are deep blue, golden green, amber, amethyst, milk white, or crystal clear. Not all are spherical. Some are egg-shaped; some cylindrical, with a knob on either end for fastening to the nets. These are called "rolling pins."

The mystery of these seashore treasures is the more intriguing because it seems hard to solve. The very idea of using fragile, blown-glass bubbles for fishing floats, to be cast into the sea where rocks and reefs abound, and waves dash them about, is a curious thought.

The first known historical mention of glass fishing floats comes from a quaint Norwegian book which states that Christopher Faye, born at Bergen, Norway, 1814, invented glass floats and first tried them out in 1844 for commercial cod fishing in the Lofoten Islands of northwest Norway. At a fishery exposition in 1865 Faye was awarded a



gold medal. His first floats were egg-shaped, but with further experience he changed them to *kugleform*, Norwegian for spherical. Skeptical Swedish fishermen who saw his exhibit could not believe them practical, for how could they be attached to the nets? Would they not be subject to constant breakage? And surely they could not withstand the pressure of great depth. Faye showed them his fully equipped nets, with each sphere enclosed in its sheath of neatly woven netting and so attached

to the "corkline." He demonstrated that they would not become waterlogged at great depth, as even the best floats of light wood do, and presented proof that they had withstood the pressure of 300 fathoms.

Storms have a way of tearing nets loose from their moorings and scattering their floats far and wide. Thus it was that glass floats introduced themselves to many nationalities. Fishermen of northwest Denmark found them on their beaches, and, realizing their purpose, adopted them. They finally found a fixed place in deep-sea trawling for shrimp in Denmark's northern waters, Kattegat



Rubbings of Japanese characters on glass floats. (Top) KITA from 14-inch float, meaning "north." (Middle) Kana symbol for syllable NI. (Bottom) Kana symbol for the syllable SE. Pronounced *keeta, nee, say*. According to Toshio Asaeda of the Academy staff, these may be short "trade mark" forms (possibly "Northern Glass Works" or some such business for the KITA symbol).

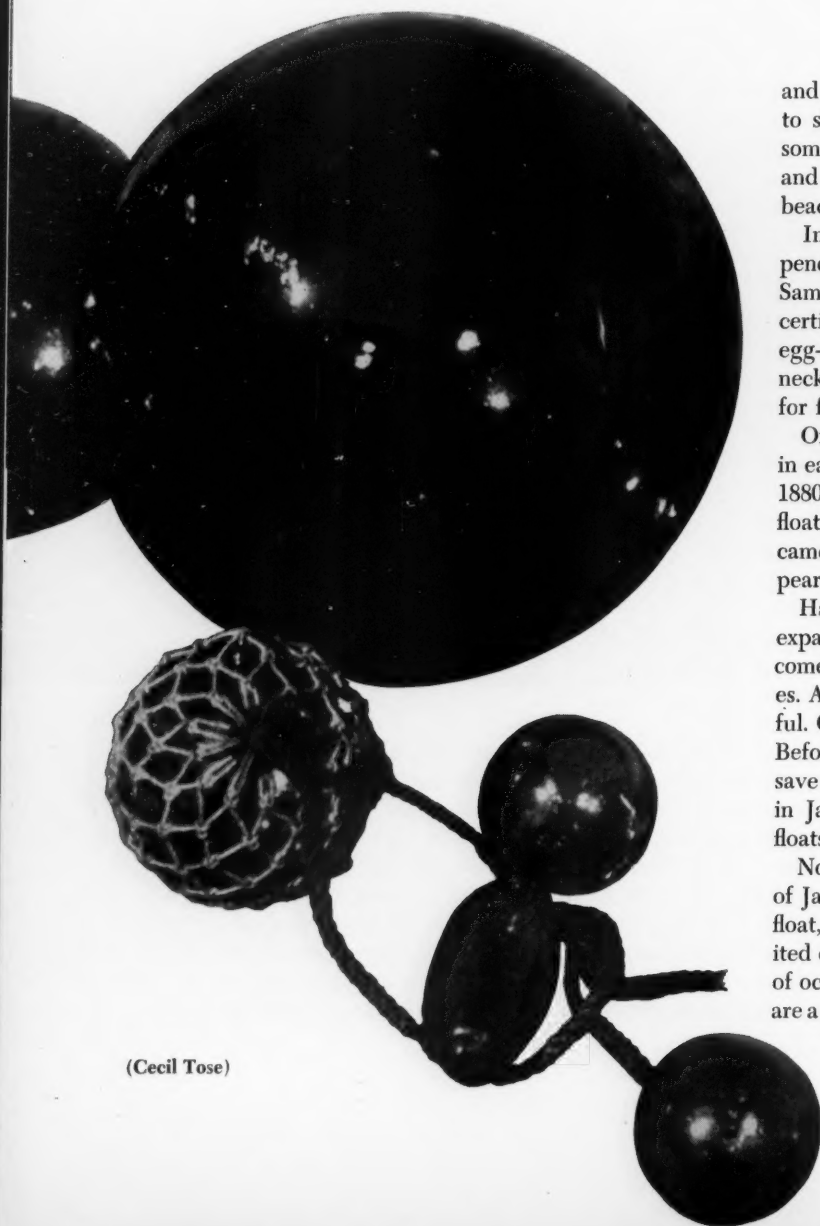
and the Skagerrak. The leap from the Skagerrak to shrimp fishing in Mexico is a great one, yet somehow it was made, and now natives of Florida and the Bahamas wonder at finding them on their beaches.

In America, glass floats were invented independently in 1877 by two brothers, David and Samuel Davis, fish-merchants of Detroit. Their certificate of patent shows their favorite form as egg-shaped, with a spherical base and a narrow neck for attaching to the net. They were intended for freshwater fishing in the Great Lakes.

On the eastern seaboard, cod fishing was done in early times from dories with hand lines. In the 1880's long-lines and gill nets supported by glass floats were used. Again, later, dragnets or trawls came into use, and glass floats have almost disappeared from the Atlantic Coast.

Hand-blown floats of Japanese make ride the expanse of the Pacific on the Japanese current to come ashore along the Northwest American beaches. After heavy storms they are especially plentiful. Glass floats were first made in Japan in 1910. Before World War II curtailed all manufacturing save for military use, there were 10 large factories in Japan whose principal production was glass floats.

Not all floats picked up on Pacific beaches are of Japanese make, however. Because these shells float, they are natural wanderers, their travels limited only by continental barriers and the vagaries of ocean gales and currents. Moreover, fishermen are a wandering race, traveling far with their boats



(Cecil Tose)

and equipment, including glass floats. So, within arm's reach, as I write these words, are glass shells picked up on the Oregon beach below me which were made or used in England, Germany, Norway, Belgium, Czechoslovakia, Russia, Japan, Maine, Key West, Lake Erie, Pittsburgh, San Francisco, and Seattle.

Place of origin may sometimes be determined by the maker's monogram or brand. A shell bearing such brand is the joy of the collector. Here before me is one with discernible Japanese characters. The next one bears the Christian cross in high relief, perhaps from Belgium. Beside it lies a small one bearing the Soviet hammer and sickle; another has a swastika and the familiar, "made in Germany." One showing a long-rayed star is branded, "British Make." A plainly stamped "F," with the maker's key number, means Fresland, Norway. Beyond, on the same shelf, are first, hand blown, then machine made floats branded "NW" for the Northwestern Glass Works of Seattle. Others have the familiar "DURAGLASS" of the Owens-Illinois Glass Company.

To understand the fascination of glass shell collecting it should be known that, through most of their history, their manufacture has been by the very oldest and most primitive of glass making methods: free-hand blowing by one or two men at a small furnace. After a float has been blown to size, very much as soap bubbles are blown, it is separated from the pipe while hot and plastic. To seal the resultant aperture, a small patch of fluid glass is applied. As a final touch, on many floats, this patch, soft as melted wax, is marked with the monogram of the craftsman, or the sign of town or country where it is made. These monographed seals lend the final touch of interest for most collectors. If you can read them, they mean much; if you cannot, they are mystifying.

In small glass factories, when a batch of metal — molten glass — has over-run the immediate need for which it was compounded, the workman may use the remainder for floats. Or he may add cullet (scrap glass) and the resultant mixture could be of any shade or texture. Thus glass floats, in common with other pioneer handicraft, show a pleasing variety, not lacking in true artistry. On the other hand, some floats are so perfectly formed we know none but the hand of a master could have shaped them.

Among hand-blown shells of Japanese make are sometimes found large floats of a purple color,



(Cecil Tose)

ranging from a deep shade to a faint, lovely amethyst. A strange modern mythology has grown up around these floats. "They say" such floats are from the private fishing fleet of the Japanese Emperor, and for a common fisherman to be found so much as holding one of them is a crime of capital importance. Facts prove that the story has no foundation of truth. In the first place, the Emperor of Japan has not now and never has had a private fishing fleet. Purple floats result from a chemical action. All crude glass, because of iron in the sand used, naturally comes in some of the well known bottle-green shades. The addition of a small amount of manganese oxide makes a crystal clear product. If an excess of manganese is used, age



Oregon beach.  
Winter storms  
bring the floats  
ashore and the  
collectors to  
the Pacific  
coast beaches.  
These are posed  
from the author's  
collection.



and long exposure to the sunlight may turn the clear glass to purple. A float made of such glass, tossed about on the waves under intense Pacific sunlight, stranded, perhaps, for longer periods on some hot south sea beach, must inevitably react to the same law. It is not the Mikado, Son of Heaven, who sends us these lovely purple floats; rather, it is the Mikado's alleged ancestor, *Amaterasu*, the

Sun Goddess herself, who provides them. Since the sun is fickle and the length of voyage uncertain, it follows that scarcely two of these purple floats are of exactly the same shade.

Even harder to read than makers' brands, but no less fascinating, are the marks left by the ocean. To attempt to measure the time, vicissitudes, and distances these free glass bubbles pass through



Author's collection,  
giving a good idea of  
the many sizes, shapes,  
and colors of glass  
floats from many parts  
of the world.

until they are picked up on the beaches, taxes the imagination. In my collection are several called "rolling pins." Because of their shape they roll up and down on the beach with each lapping wave. Thus some take on a sandblast finish with lines as distinct as though done on a lathe. Others, of spherical form, are ground by the sand to bear a soft, frosted finish, translucent and pleasing. Strangest of all, and rarest, are those left with a small fragment of glass within the interior. One, especially, I possess — a tiny thing, scarcely two inches in diameter. The fragment of glass weighs not more than two or three grains, yet, from tossing and rolling and spinning on the waves — how many years, who can guess? — its interior is ground to an incomparable white milkiness.


Many floats, large and small, come to the shore trailing long streamers of mossy seaweed or oceanic grasses in which live marine worms, ghostly, transparent phantom shrimp, and embryonic marine life of many kinds. More striking are those bearing acorn barnacles, sometimes covering the entire globe, sometimes singly, like a Shasta rearing its white cone above the common plains.

Sometimes glass floats are submerged in depths they cannot withstand, and are crushed to fragments. Others, with more resistance, drink in water through their very substance — drink, and become drunken, for "drunk" is the term used by

fishermen for floats that come up heavy and partly filled with water.

The ability of glass floats to withstand high pressure gives them a distinct advantage over any other material. All wood floats, whether of cork or bundles of cane joints, soon become waterlogged and refuse to rise again. Moreover, glass floats are less expensive than wooden ones. The Seattle factory, which first made hand blown floats in 1933, now has machines that can turn out 20 to 30 perfectly finished floats every minute.

When World War II cut off the supply from Japan, Owens-Illinois machine-made them for a short time, 1942-3, in the Oakland factory. In 1947 four factories were again making floats in Japan, and Japanese floats are sold today in the marine hardware and fishermen's supply stores of San Francisco's North Beach. But, according to one dealer, it is not the fishermen who buy them; it is the decorators. And they can pay \$37.00 for a single one of 20-inch diameter. So also can a rich collector — but what fun is collecting that way?

So long as fishermen string their nets with these spheres, like huge necklaces of glass beads, so surely as the sea and the winds take toll of them, avid collectors will comb the beaches and carry them home in triumph, to barter, to sell, to decorate their cottages or game rooms, or to add to their collections of things from the sea. 

This clear glass ball was washed up on a northern California beach. (Cecil Tose)



# ANNE J. ALEXANDER Bat, Bat, Come Under My Hat

*"Bat, bat, come under my hat  
And I'll give you a slice of bacon . . ."*

SO RUNS the old nursery rhyme. The bat was under my hat, and I did offer her a slice of bacon. She smelt it, turned her face to the wall, and, changing her foothold, she recrossed her wings. Was this what ought to have happened? I did not know the rest of the rhyme, and there were no books available that told of keeping fruit bats as pets. But I can now tell you a little about the behavior of a fruit bat.

It was Sunday afternoon in mid-November 1952. Tetrarch's mother was brought in to me, shot down from her roost in the tall candlenut tree near my home. The bats are shot down, apart from the "sport" of it, because they eat and damage an enormous amount of fruit and because the farm Negroes use them as "medicine."

It took a quarter of an hour to disentangle Tetrarch, who was attached by claw and mouth to the yellow fur and pink nipples of her dead mother's breast. The baby was brownish gray all over, her fur being soft and not lying in any particular direction. Her eyes, her most outstanding feature, were enormous compared to her face. They were very prominent, looking as if the lids would never fit over them, and were a golden khaki. She already had the little white patches of fur at the edges of her ears, which you can see in the photograph. The fur of these patches is a little longer than that of the rest of her body, so that they look like two small powder puffs.

To begin with, feeding the baby was a problem. She was not particularly adept at feeding from a bottle. I think that the rubber nipple was not soft enough for her to get a mouthful to suck. After the batling had squeaked hungrily for several hours, I found that she fed much better on milk with banana mashed into it. This may have been because she preferred the taste of this mixture, or it may have been because the bottle could then be tipped so that the food ran out at the correct rate for her to drink it. Within two days she was helping herself to banana, hung up for her on a string from her perch on the electric light cord. For a time this solved the food problem.

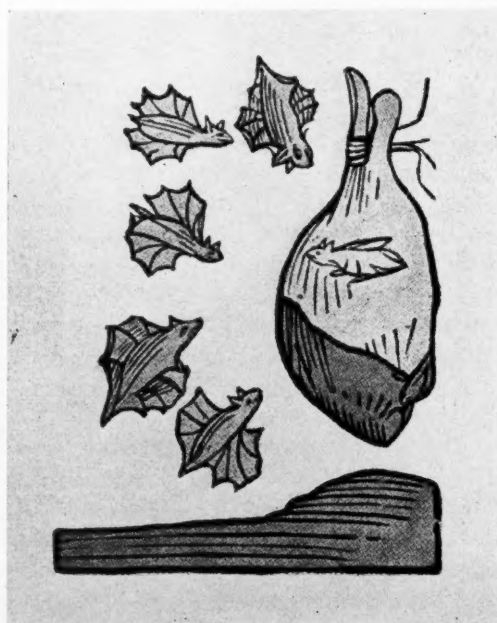
Fearing that after her mother's warm fur a cardboard box might be too cold for the baby, I tried to hang her up against a hot-water bottle; but she resented this, possibly because the odor of rubber offended her keen sense of smell. Left in a drawer, warmed by the hot-water bottle and unable to get out, she squeaked miserably. Eventually I had the idea of suspending a woolen cap of mine by its tassel and inducing her to hang upside down inside it. This suited Tetrarch's fancy perfectly, and from then on she had a number of people lifting her cap to them.

Bats feeding on a "leg of bacon," as pictured in the *Hortus Sanitatis* ("Garden of Health"), a medieval work on natural history printed in 1491. (From the copy in the British Museum. Fig. 1 in *Bats* by G. M. Allen.)

Fruit bats, of course, hang upside down nearly all the time. On landing, which she does the right way up, Tetrarch quickly reverses to the head-downward position, with her back to the perch. In our house this is usually the top frill of a curtain. To this she clings with her hind feet which are like small Japanese lawn rakes in shape, the toes being thin and brown and all of the same length, with sharp curved claws. The main hook of her wing, that at the end of her "thumb," holds a triangle of skin which she can extend at lighting speed to catch a slippery morsel escaping from her mouth. The hook of the "first finger," though it is as sharp, seems less useful. This extra hook is one of the easiest ways of distinguishing the Megachiroptera or fruit bats, from the Microchiroptera or mosquito bats.

To get into her cap without help was a terrible struggle for Tetrarch. She would crawl down the outside of it until she could get her head into the opening. Her claws used to get caught in the soft folds of the cap, and the really difficult part of the business was to push the cap open so as to make room for both head and hooks to get in. It was interesting to see her efforts, but one was invariably tempted to help her.

Feeding, once over the initial stage, was easy only for a time. We were to find that fruit bats in captivity demand, and get, a great variety of fruit. Two nights of one type of food are enough for Tetrarch. Bananas, grapes, apples, guavas, pears, peaches, mangoes, paw-paws and figs are among her favorites. Citrus she will not eat; but masobe (a small wild berry), persimmons, plums, and custard-apples she has tried and liked. When you hand her a piece of fruit she reaches out with the hook of one wing, clutches your hand so that





you cannot withdraw it, and takes the fruit in her mouth. If she has had enough, has a small piece in her mouth, or the proffered piece is too big for her mouth, she holds onto the support with one foot, taking the fruit in the claws of the other. She is as greedy as a small child. Sitting with stuffed cheeks and a piece of fruit in her foot, she will still reach out for another bit. She sometimes has to drop the contents of foot or mouth or both to be able to hold the new gift.

Tetrarch eats most types of insect that we have offered her. Large moths with fluttering wings excite her to a fury of "yattering," her sound of annoyance. After killing them, however, she usually drops them. The sight or scent of an insect excites her much more than fruit does. She smells the animal for a second, then suddenly snatches it out of your hand, clutches it wildly with her wing hooks, and bites it with evident fierceness. Large locusts with strong spines on their legs, or big Hottentot-gods (mantids) which bit her,

were thrown down when they appeared to be hurting her. On being offered a rhinoceros beetle — a local scarab very hard of shell — she made a valiant effort to hold and kill it. Her efforts were in vain, a fact not surprising in that the beetle's weight must have approximated her own.

Besides the attempt (mentioned in the beginning) to feed her on bacon, I offered Tetrarch other raw meats. Only once did she eat a little, a piece of liver. She has never been induced to repeat this, and I suspect that the piece in question was just old enough to have a sweet taste, and that it was this that prompted her to try it. Sweetened condensed milk, or fresh milk with sugar added, Tetrarch regards as a great treat. Still hanging head downward from her perch, she laps this from spoon or dish, sometimes having difficulty because, in her eagerness, she starts by burying her nose in it and lapping much too heartily, so that her nostrils get filled with milk. In her normal feeding,

▲ *Left to right:* Tetrarch, the author. Miss Alexander's article came to *Pacific Discovery* through the good offices of Dr. Raymond B. Cowles, professor of zoology, University of California at Los Angeles, who has not met her but has visited her home at Inchanga, Natal, Union of South Africa. Dr. Cowles presumes this and the next photograph to have been taken by "Professor Bush, Chairman of the Zoology Department, Natal University," where Anne Alexander studied until she won a prized scholarship to Rhodes University. She is working for a Master's degree in biology.



the juice which runs from her mouth as she chews does not cause her any trouble. Nature has provided a deep groove between the nostrils and the juice runs down this channel, forming great hanging drops at the end, which she may either lick up or allow to drop off.

Night is the natural feeding time, and it sometimes happens that Tetrarch exhausts her food supply before morning. Occasionally, being too lazy to get out of bed to attend to her urgent squeaks for food, I have held the dish of milk out to her from my bed. After a battery of abuse, she has settled on my hand and the edge of the dish to drink, driven by hunger to feed in an unnatural position.

Washing is a time consuming performance for Tetrarch. Her tongue is very long and slender, and like a twisting pink face flannel reaches right up to and over her eyes and around the bases of her ears. Her wings always seem to need an enormous amount of attention. On the two occasions on which she has come in with a hole in her wing membrane, it has interested us to see her tongue pass through the hole and lick the other side of the wing. It was also interesting to notice, by the way, that these tears in her wing healed over within a week or two and appeared to cause her no inconvenience in flying. Tetrarch will sometimes scratch her head with one of her feet, licking this "comb" carefully after each effort. Using a 10x lens, we have never been able to find parasites on her, though these are easily seen on the little mosquito bats. Another endearing quality is the pleasant and slightly fruity scent of her body.

A little earlier it was said that Tetrarch hangs upside down all the time except when she has just landed. This is not strictly true since, for obvious hygienic reasons, all excretion and defecation must be performed hanging head uppermost. To do this she releases her foothold on the curtain, and now grips it with her wing hooks, with feet hanging downwards. Intense concentration is apparent in all the lines of the muscles of her furry back, and her ears lie flat back against her head like those of a cat in a similar situation. She usually gives a vigorous "hip-swing" before returning to her upside down position, in which she will then have a brief wash. Both solids and liquids pass quickly through Tetrarch. About ten minutes after a milk feed, sour milk can be smelt in her feces.

In flight, no sounds can be heard except the occasional call note and the flutter of her wings. Whether she uses echo location seems doubtful, as she has several times collided with the panes of my window when I have thoughtlessly tried to keep the winter's draught from my bedroom. This might be explained as an attempt at landing, or the result of fatigue. The former seems unlikely because of the force with which she hit the glass; and also the latter as she has never, on any other occasions, shown any signs of fatigue, always circling once or twice around the room before settling,

Sounds which she undoubtedly does make, however, are the squeaks when she demands food. These are not particularly loud but are of such urgency that they are difficult to ignore. When there are bats "talking" in the trees outside, I believe that Tetrarch's voice can be distinguished from the rest. This is probably not just imagination on my part, because frequently the recognition of Tetrarch's voice raised in argument outside is followed by her flying in to visit us.

The flapping of the wings of a large moth, the shaking of a limp hand so that it sounds like the flight of a bat, or the flapping of a coat sleeve will make her squeak excitedly for a short time. If this cheating is carried on for any length of time, however, she ignores it and us. Her yattering of annoyance is elicited most easily by putting your hear near her face. The sound is like the letter "k" repeated rapidly. She keeps her mouth half open while doing this, and was once provoked enough to bite my mother, drawing blood. I have tried to repeat this, but have not yet been hard-hearted enough to succeed, though she threatens violently that she intends to bite.

From Tetrarch's dislike of having human hair near her face, we discovered a peculiar taste or behavior pattern. She will, if presented with an ear that does not smell too strongly of recent soaping, wash the inside of that ear carefully with her long soft tongue. Since the dirtier the ear is, the more Tetrarch is interested, this is an honor for which few of the family make public claim.

When alerted, as by a bat flying outside, or a strange noise in the room, Tetrarch "flickers" her large membranous ears. If she is annoyed about something or is trying to do something difficult, she flattens her ears back, looking either very aggressive or very small and helpless. She does a vast amount of yawning, opening her mouth so wide that the position of her ears is affected, and the soft skin around her mouth falls in.

I do not know how old Tetrarch was when I first got her, but, although there is no real proof, I do not think she had yet learned to fly. I made only one attempt to test her flying ability, by dropping her from a height of about 18 inches above the bed. She just opened her wings slightly and "belly-flopped" down. About five days after we got her, when she was quite at home in her cap, she flew for the first time to my knowledge. The light was off, the distance no more than a yard or two, and the landing was a substantial thump on the floor. She did not try again that night, but from this time onwards she made short "jumps," her landings seeming to get less and less clumsy. Occasionally she may still bungle a landing, especially if it is very dark; but in spite of this, I feel sure that Tetrarch was at that time learning to fly.

In March, shortly before I returned to University, I removed the wire netting that had covered my win-



Tetrarch lunches — or anyhow munches — contentedly on a grasshopper. Nearly life size.

dows. On the first night of potential freedom, Tetrarch did not go out. On the second, she hung for some time on the curtain beside the open window, her wings half raised, looking out. Finally she spread her wings and a moment later I saw her shape pass outside the window as she flew off into the night. To all who had known of the friendship this seemed the end. Bats do not become domesticated. Tetrarch had only been a captive in an extra large cage . . .

A month later, working at the University, I received a telegram from home announcing the return of a bat. Leaving my work, forgetting to ask for permission to leave the residence, I rushed home.

Disturbed by some sound, my mother had gone out at about five o'clock in the morning to investigate. A bat flew along the veranda, circled around her head and squeaked loudly, then followed my mother through the open door, and settled on the curtain. Tetrarch—of course it was she—greedily stuffed her mouth with all the banana offered her, washed herself carefully, and, folding her wings around her, went to sleep. She had returned willingly, a tame bat, no longer a captive.

Since then, except for one long absence and a few nights missed here and there — especially when people come from a distance to see her — Tetrarch returns each night for the offerings of fruit, milk, or insects that she knows she will get. Apart from a few mistakes, she confines her visits to only two of our thirty bedrooms, my mother's and mine. When I return home she visits my room even on the first night. This may have something to do with the fact that (a) my light is kept on longer than others in the house, (b) my room has a larger aperture through which she can enter. Whatever her reasons, I accept her visits as a personal honor.

After she had been in the room for a few hours, had fed well, had fruit hanging for her in the garden, and was beginning to tire me with her interruptions, I used to pull down the blind to prevent her re-entry after she had been turned out. At first this had the desired effect. She flapped past the window, flicked the blind with her wings, squeaked imperiously, and flew away. Lately, however, she has learned to crawl in under the edge of the blind and climb through the window. Her preference for my room may still be due to causes other than personal affection. She was, after all, reared there!

Wishing to call the bat, it has been customary for members of the family to go along the veranda and under the nearby trees, each one making, to his or her mind, the sound nearest Tetrarch's call. Sometimes she will answer these summons with squeaks, sometimes with a visit. Usually there is no answer. Other animals, however, also answer these sounds. The Siamese cat, who has never been near enough to the bat to touch her, recognizes these whistlings for what they

are. Having had to yield a share of human adulation to Tetrarch, he will respond angrily to the stimulus of "bat-calling."

During the day, calling to a bat hanging high in a tree has resulted in the animal's turning to look down at us. This response has always supported our suspicion that the animal was Tetrarch, but we have had no conclusive evidence of this. An attempt to distinguish her by staining her white ear-patches with red mercurochrome failed, because the color had been cleaned off before the next occasion on which we found bats in the trees by day.

Tetrarch's reaction to animals other than insects were tested in only a few cases. On my holding a small mosquito bat up to her, she smelled it interestedly. It swore violently as mosquito bats do when stimulated by almost any means after being taken from their hide-outs. Tetrarch then returned the sentiment by yattering furiously. She turned disinterestedly from the face of the Siamese cat, changing from foot to foot and yawning. When his furry back was presented to her, she exploded in a fury of yattering.

Whether she can distinguish members of the family is open to doubt. She will come more readily onto my mother's or my fingers, but whether this is merely due to the absence of tobacco smell on our hands, the different size or texture, we do not know. The "strangeness" of strangers is readily recognized, though it is uncertain whether this recognition is through their clumsy movements towards her, their scent, their noise, the different visual stimuli she gets from them, or merely that when she is being shown to strangers there are generally more people than usual in the room. In their presence Tetrarch gets excited and flies wildly around the room, defecating as she goes, with obviously embarrassing results. This tendency to defecate or excrete when frightened seems to occur in frogs and snakes as well as in fruit bats. If Tetrarch is flying about in the darkened room, a sudden noise or movement will cause her to leave trails of fig, banana, and milk across the room. This is, as far as I can see, her only drawback as a household pet.

It was about August that we began to suspect Tetrarch had a mate. At this stage we were still not sure of her sex. Male fruit bats of the genus *Epomorphorus* are said to have a white patch of fur on each shoulder. We were not sure, however, whether (a) this was true, or (b) at what stage this would develop. The other bat, a darker, thinner, and smaller animal, was sometimes seen hanging in a garden archway with Tetrarch. It never allowed us to come close to it, though another wild fruit bat allowed me to get my hand within six inches of it before flying away. Tetrarch, if she was indoors, would squeak to the other bat as it flew by. She would sometimes have long squeaking conversations with a strange bat in the trees before flying in. My mother always explained that Tetrarch was trying



to entice her mate indoors to get food, while the stranger was trying to explain how unnatural and dangerous it was for any bat to fly into a lighted, noisy human habitation — and ours is a hotel.

Towards the end of the year, in November, Tetrarch's shape began to change. She had become more orange than brown, and now she began to look more cylindrical than pear-shaped. What were at first taken for parasites on either side of her breast, appeared as her newly polished nipples. By December Tetrarch was obviously pregnant.

There were, of course, the usual false alarms. One night she clung to the curtain, doubled up as if in pain, for about an hour and a half, would take no food, and finally flew heavily out. Disappointed in our hopes of witnessing a birth, we decided later that what we had seen had been merely an attack of indigestion.

An hour before 1954, Tetrarch flew into my room. Clinging onto the fur of her breast was a tiny gray baby. I was almost too excited to hold the dish of milk for her to drink. We watched the little mother eating, washing herself and the baby, and sleeping. She did not object to our unfolding her wings to look at her baby, and I do not think that she would have minded if we detached the baby, though only something very drastic would have broken that small animal's hold on its mother.

The baby's fur was about the same shade as Tetrarch's was when we first saw her. The little powder puffs were there at the base of the rounded ears, and the fur was still wet and not fluffy on its back. All was beautiful except the stomach, which, exposed during the mother's vigorous washing, appeared unfurred, red and raw-looking.

Baby stayed firmly attached all the time except when changing from one nipple to the other, or when Tetrarch's washing tore the nipple from its mouth.

Tetrarch stayed indoors all that night and the next day. Unfortunately, as it was the busy holiday time, we did not take time off to get photographs. The following night, thinking that she needed exercise, we took her outside, and encouraged her to fly off with her baby.

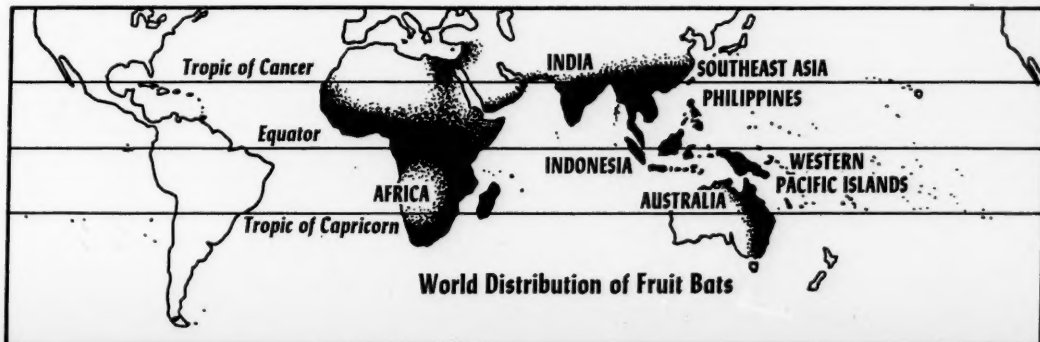
A few hours later Tetrarch flew squeaking into my room. She landed on the curtain, smelt all over that, smelt all over my dressing gown, squeaking all the time. She flew about the room, landed on top of the wardrobe, searched that, and flew along an inch or so above the floor, even exploring under the bed.

Settling only long enough for me to discover that there was no baby at her breast, she refused food, and flew out. Shortly after this she was back again, and the whole pitiful performance was repeated. We went out with electric torches and looked under all the trees, searching the garden arches and the veranda. It was hopeless. The baby might have been miles away, or almost at our feet.

During the day that Tetrarch had spent indoors with her baby, she had flown around the room a couple of times, and had landed clumsily, making the baby squeak. We had remarked on this at the time, saying that her landing was uneven. Whether she killed her baby by knocking it during a hard landing, or whether some predator — rat, snake, or bat-hawk — could have taken it from her, we will never know. The tenacity with which the living baby had clung to its mother's breast makes me doubt whether it could have been forcibly removed without leaving at least some marks of a struggle on the mother. It is common knowledge that animals are often less efficient in caring for their first infants than in rearing later offspring; and this, with the suggestion of bad landing, points to the first explanation being the more probable of the two. Perhaps there are other explanations that would seem more likely if one knew more about the life of a wild fruit bat.

Tetrarch still returns almost every evening, though it is seventeen months since she was given complete freedom. Before the July vacation this year (1954), she started to shorten her visits, staying only long enough to grab a piece of fruit and fly off. During a three-week stay at home I managed, by milk feeding her and tying up fruit too big for her to carry away, to get her to return to her old habits. Now she comes in, settles down for a meal, washes herself thoroughly, defecates (over waste paper carefully placed), then, wrapping her wings around her like a large shawl, she sleeps until the performance is repeated in about an hour's time.

Her abdomen seems, at the moment, to be less the shape of a pear, she has put on weight so that she now weighs 3.5 ounces, and her wing span has increased from 15 inches (when we first measured it 14 months ago) to 20 inches. Now that she may be a fully grown, wiser, and again pregnant little bat, we hope that she has a good chance of teaching us a little more about bat behavior. Maybe Tetrarch's new baby will eat bacon. . . .







**DON BLEITZ**

## WINTER VISITOR

A number of kinds of gulls occur at one season or another along the Pacific coast of North America. Some of them are difficult for the beginner to identify — but not the adult Heermann gull. None other has the combination of white head, dark gray body, and deep red bill with a black tip.

He has also the distinction of a migration pattern reversing the usual trend of Northern Hemisphere birds. Instead of moving southward after breeding along the coast of Baja California the Heermann gull goes northward as far as Puget Sound where it may be seen in late summer and autumn. The species is a fairly common winter visitor along the California coast.



# Burro or Bighorn?

PHILIP FERRY

The bighorn sheep and burro photographs by Lowell Sumner, courtesy of the National Park Service.



**D**EATH VALLEY is a great 140-mile long depression lying between California's Panamint and Amargosa ranges. The valley is commonly thought to be one of the most sterile tracts on earth, yet it actually supports a surprising variety of flora and fauna. Included among the latter are some introduced species which, as is so frequently the case with hardy emigrants, have managed to adapt themselves at least as well as the native species. One of these introduced forms is the burro, a beast which has had a long and distinguished history in the exploration, settlement, and literature of the West.

Brought to southwestern America, by way of the Iberian Peninsula from its native North Africa, the burro came fully adapted even to the extremes of hot dryness and rugged terrain found in Death Valley. Here it has thrived while taking toll of the

sparse forage and scant water at the expense of less sturdy native species, particularly the bighorn sheep, which is suffering from the inroads of this pushing Johnny-come-lately. Many conservationists are concerned over the threatened displacement. The National Park Service is of the opinion that the burro and the bighorn cannot abide on the same range. The issue becomes one of ultimate survival: the battle for possession of the range and water holes, both of which are severely limited in desert regions.

To those who feel a sentimental attachment to the stubborn and sturdy burro, there is little that can be said in refutation of this charge. The burro has become such a lovable part of the Western historical scene and so characteristic of the desert landscape as to seem as much at home there — as indeed he is — as a sidewinder or a mesquite

## The Park Service faces a dilemma as two picturesque animal species compete for a living in Death Valley

tree. Ask any Westerner if he would care to see the burro banished and the answer is an overwhelming no. Yet Park rangers say that wherever the burro and the bighorn have overlapped in their range, the bighorn has invariably been crowded out. The bighorn is a super-sensitive creature that must have a completely balanced range; it has neither the burro's stamina nor that animal's ability to adapt itself to a shrinking range and a diminishing water supply. In any contest between the two, the bighorn must inevitably yield.

Surprisingly, the burro population of the Death Valley area is not large, but then, neither is that of the bighorn. It is doubtful if there are more than a thousand burros in the two million acres of Death Valley National Monument. The burros are concentrated to a large extent in the Panamint Mountains, which form the western rampart of the Death Valley trough, being most abundant in Butte Valley. The bighorns are more widely scattered. Both are also found in the mountains which form the eastern margin of the valley, the Grapevines and to some extent, the Funerals, which together form the Amargosa Range. The burros thrive best from 2,000 to 7,000 feet above the valley floor, obviously following the feed and water. Much of this territory happens also to be the habitat of the bighorn sheep, although the latter thrive best from 5,000 feet upward.

While the burro is not a native species, it was

here before any white human settlers in the Far West. Brought to the Western Hemisphere by the Spaniards (*burro* is Spanish) it was used in all mining operations in what is now Latin America and made its way northward with the Spanish explorers. They were brought into Death Valley by prospectors. Abandoned by or escaped from these wandering men, they have done all right for themselves in our southwestern deserts!

In answer to my query as to the National Park Service's stand in the controversy, Park Naturalist L. Floyd Keller, of Death Valley National Monument, explained as follows:

"Death Valley is one of the driest places, perhaps the driest, in the Western Hemisphere, if not in the entire world. The annual rainfall averages less than two inches, hence forage is not plentiful. Burros are heavy eaters and quickly deplete the limited forage, leaving little if any for the less aggressive bighorns. In the spring and early summer the mountain sheep frequent the high places, but in mid-summer they migrate downward and seek forage at lower elevations. That is when they come into direct competition with the burros — which have, most likely, grazed out the range below and are moving upward.

"The bighorn is a native species and it is our job to guard it against any and all intruders. Ten years ago there were 500 head of Nelson's bighorn in the Death Valley region. Today there are perhaps half



that number. Ten years ago there were 1,000 burros in the same area; today, in spite of drastic measures to reduce their numbers there are still a thousand burros in the area. Since the burros feed over the entire range and tend to crowd out other forms of animal life, they must be controlled before they gain exclusive possession of the range."

"What form of control does the Park Service favor and to what extent is control to be carried out?" I asked.

"The burros are thinned out by shooting," he revealed. "As to the extent of the program, if we obeyed the letter of the law, our duty would require us to eliminate every last burro in Death Valley National Monument. However," he continued ruefully, "we have been unable to do so, and for two reasons, namely, public sentiment and inability to control the movements of burros outside the Monument. Wandering burros cross the Monument boundaries and encroach on the hereditary domain of the bighorn. While they remain outside the Monument boundaries, they are protected by the same laws which protect all wild creatures.

"What makes control particularly distasteful," Keller added sadly, "is the fact that with the public at large the burros are just as popular as the bighorns. In fact, if the truth be told, they are more popular since they can be seen at close range while Nelson's bighorn is a wary creature which avoids man and his haunts."

What the bighorn is doing in the Death Valley region is anybody's guess. California has hundreds of miles of mountain range which could offer sanctuary to unlimited numbers of wild sheep but for some unaccountable reason the Nelson's bighorn has settled in the ranges on either margin of Death Valley. Here they live in surroundings which other animals habitually shun, occupying the driest parts of the range; frequently the most arid sections will support the most sheep. Since feed is never plentiful in such surroundings, they subsist on a variety of low-calorie vegetation, including grasses, mosses, lichens, brush, buckthorn, and even spiny barrel cactus. Many of the low growing desert plants on which they browse are so inconspicuous most of us don't notice them.

Obtaining drinking water is perhaps their most pressing problem and the principal charge brought by the sheep conservationists has been that the burros — together with the wild horses and domestic cattle — foul the springs and waterholes until

the wild sheep will no longer use them. Although the sheep can go for long intervals without water, the time comes when they must drink, and obtaining water may mean a trip of twenty miles. In the summer, when the Death Valley region is one of the hottest areas on the face of the earth, the sheep must make at least two trips a week for water.

The scant water supply of the Death Valley region is the principal point of friction in this battle of the desert ranges. The burros puddle every waterhole they frequent; they trample out the springs; they wallow like hogs; they even eliminate in the water. The bighorn, because of its nature, will not frequent springs which have been fouled by the burros. Deprived of their natural watering holes, they resort to cacti, of which the desert seldom supports enough to provide the necessary moisture. In spite of these incriminating facts, there are those who maintain the burro is entitled to equal acceptance with the bighorn as a colorful denizen of the desert.

"You might think there would be plenty of room on the desert for both burros and bighorns," observes Mr. Lowell Sumner, biologist for Region Four of the National Park Service — which includes the Death Valley area — and one-time economic biologist for the California Division of Fish and Game. "The animals range over at least 50 per cent of the total area of the Cottonwoods and Panamints. However, during the long hot summer days, many springs dry up entirely. It is then that trouble develops, as the thirsty animals converge at the remaining trickles.

"The bighorns, uneasy when away from their protecting crags (bighorns appear to feel safe only when looking down on a potential enemy), straggle down to drink in twos or threes, or singly, and retreat to safer ground after the thirst is quenched. The burros arrive in larger bands, they stay longer, and consume more water. Originally native to the African desert, the burros have no serious natural enemies in our southwestern deserts since the passing of the wolf.

"Another factor bearing on the conflict," Sumner continues, "is that bighorn watering places dry up sooner than burro watering places. Most of the Death Valley springs and waterholes occupy what might be called a middle ground; they are not found on the lowest flats nor at the highest elevations, but at a sort of middle level. However, the permanent springs are usually the lower ones because, like the lower stretches of a river, they col-




lect water from a wide drainage area. Similarly, the lower seep of a series tends to have the best flow, as at Sheep Springs. But the lowest springs are precisely the ones most accessible to the wild burros. Therefore the bighorns have been forced to rely on the smaller seeps in the higher, more rugged country, many of which dry up early in the summer. This condition has been worsened by the continuing drought of the past several years. The long dry cycle in California and Arizona, which is now in its tenth season, has dried up many waterholes and reduced the available forage."

"Has the Park Service considered the possibility of compromise in the controversy?" I inquired.

"Yes," Sumner answered. "The Service recognizes the need to preserve a sufficient number of burros to maintain the historic picture but not enough to threaten the existence of another species. On the basis of extensive counts begun by field parties in 1939, it was estimated at that time Death Valley National Monument had approximately 1,000 wild burros and 400 bighorns, and that the trend was steadily in the direction of still more burros and fewer bighorns. No intensive census has been undertaken in bighorn terrain since the war. Taking into account the combined effects of the drought years and the competition with the

burros, I would guess their numbers may have dropped to about 300. A workable and economically feasible proposal is to hold down the burro population to a safe maximum by systematic and periodic shooting and by making some of the waterholes inaccessible to them. This latter can be achieved by constructing rock barriers near springs which are located in narrow and sheer-walled canyons where such obstructions can be erected easily. So far the continuing manpower shortage has kept us from putting this program into effect.

"There is no need to fear the number of wild burros may drop too low. By Old World ancestry better adapted to the desert than wild horses ever were, they have amply demonstrated their ability to multiply and spread out in spite of control measures, and now regularly range over hundreds of square miles of territory where they were not found in the days of the gold prospectors. If they do not take over the entire range it will be in part because they may eat themselves out."

Such is the nature of the conflict which centers around two equally picturesque denizens of Western desert regions. Lovers of the desert country hope a balance will be achieved which will permit both species to survive. 





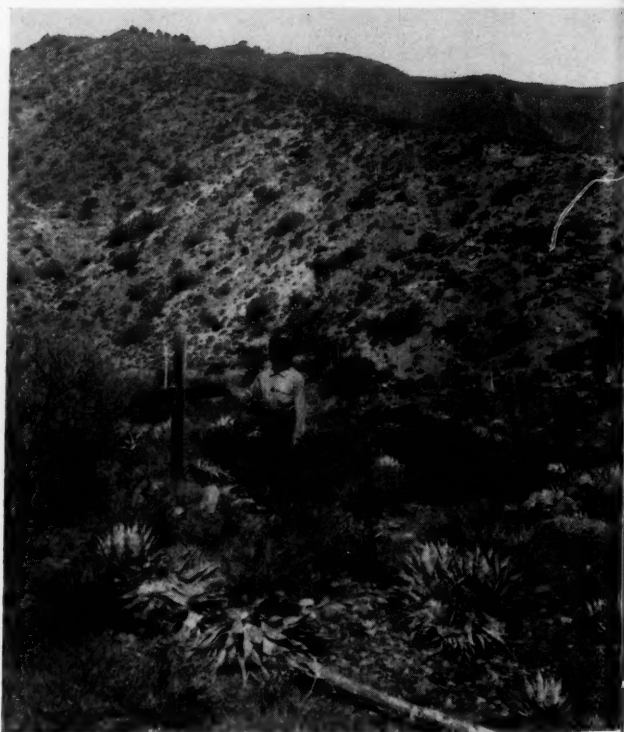
# The Pines of Cedros

Photographs by the author

## GEORGE DURHAM

ISLA DE CEDROS is a lofty, rugged island lying off the west coast of Mexico, just under the 30th parallel of latitude. In the age of sail it was of great importance as a place of resort for explorers, the Manila galleons, and later whale and seal hunters. It possesses the highest land near the Pacific side of Baja California, and was the best place to secure wood, water, and a sheltered anchorage.

In recent years Cedros' economic importance has hinged on its position as the richest center of abalone production on the coast. To biologists, however, it is most noteworthy as the border monument at a major ecological frontier. Here cold sea currents from the north constantly press against the warmer southern water, while Cedros helps to fend them off. At Cedros the marine life forms of the southern California coast give way to warm-water species which characterize more southern latitudes. Here also fossil beds and the varied plant and animal life of the island and its surrounding waters reveal that the cold-warm frontier has been pushed back and forth past the island many times in an age-old tug-of-war of climatic forces.



From Cedros' desert eastern shore one can see only a fringe of the tops of the pines along the ridge. (See also "California's Bishop Pines" by John Thomas Howell, *PD*, January-February 1952, pp. 12-17.)



The island village is situated on the eastern shore of Cedros, a sterile, sunburnt land which is usually represented on life-zone maps as Lower Sonoran desert. I disembarked from a small coastal steamer at the cannery pier and on the next day hiked to the summit of Cedros Mountain, the metamorphic mass which overshadows all the southern half of the island.

Primarily I was seeking traces left by the band of Cochimi Indians who inhabited the island until 1732, when the Jesuit Father Sigismundo Taraval removed them to the mainland. I also felt a long-contained curiosity about the pines of Cedros. I knew that *Pinus muricata*\* a common pine of the California coast, was native to the island which Francisco de Ulloa had sighted in 1540 and which was named Cerros (now Cedros) because the pines on its crest were taken at distant sight for cedars. Modern scientific descriptions of the island have paid deference to the pines, whose type locality is

\*The Cedros pines have been recognized as a variety, *cedrensis*, by John Thomas Howell, curator of botany of the California Academy of Sciences (*Leaflets of Western Botany*, vol. 3, Feb. 1941, p. 3).—Ed.

San Luis Obispo, California, by assigning the northwestern part of the island to the Transition life-zone. Transition zone, near sea level and so far to the south? That, I would have to see!

This was a desert isle indeed. The landscape of red *pedregal* and gray arroyos was little relieved by the grotesque elephant trees and widely scattered cactus. No grass lived more than a few feet from the trickling springs in rocky clefts, and the few junipers I found near the summit were contorted, struggling things.

From the peak I could sight far along the spine of the granitic northern range and — there they were! Two tiny groves of pines made dead black blots on the naked ridge. Incongruous and alone, they seemed; hard-bitten hangers-on from a moister age. I saw in them a testament to the stubbornness of life, but the surrounding desert was obviously ascendant. Transition zone? Scarcely.

Back in the village the islanders told me that a larger *piñal* lying farther to the north would be easiest to reach from the eastern shore, as fishermen frequently visit it to hunt the rare dark-haired deer peculiar to the island. Therefore I hired two

▲ Two small groves of pines are visible in the middle distance from the 3,950-foot summit of Cedros Mountain. The large pine grove of the island's north end is hidden by Gill Peak, 3,448-foot summit of the northern range.



Cactus meets pine at the crest between the arid east slope and the fog-soaked west slope of Cedros.

boys with a skiff for the 20-mile trip to *punta norte*.

As the boat approached the northern landing a fringe of pines became visible along the island's ridgepole. We set out up a stony gulch which led directly to the ridge. After we'd hiked an hour, at an elevation of about 1,500 feet a few straggling pines appeared in the canyon, but still the terrain was desert — cactus and thorn bushes scattered widely on the bare rocks and mineral-stained soil. As we began to ascend the headwall of the gorge

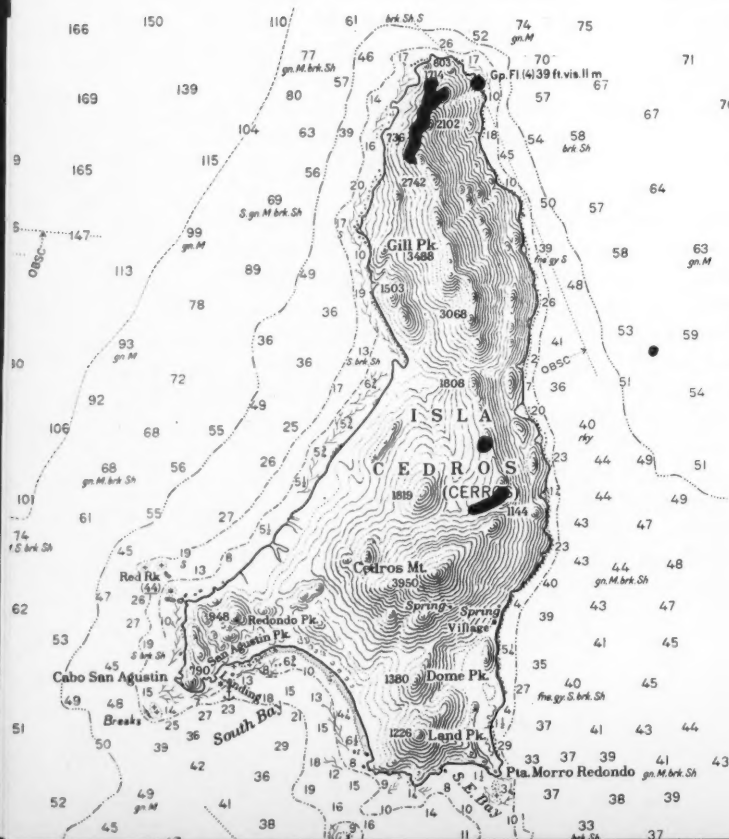
my companions turned aside to look for deer. The last few yards to the ridge were as sweaty and sun-racked as any desert climb. Even the sea, far below, seemed hot and breathless.

Abruptly the slope leveled off and a blast of chill sea-wind made me shiver as I scrambled the last few feet to the apex of the ridge. The change from Lower Sonoran desert to Transition zone forest was startling in its suddenness. Down the western side a dark wood stood still and dank, while the wind whistled above the treetops. The pines grew close and straight, stands of vigorous saplings interspersed with old monarchs of the ridge. I think none was more than 70 feet tall or two feet through the trunk, but yucca and viznaga, the barrel cactus, were their closest neighbors!

A thick carpet of needles was strange underfoot. I thrust my hand in, and drew it out moist and musky with the odor of rich black earth. The Pacific surf thundered on the western cliffs, and while I stood on the ridge great billows of the fog which gives life to this ghostly woodland began to surge up the slope and send sudden tongues of mist scudding past me. It was too much. I fled back down the desert side, welcoming the hot clarity of a naked, visible world.

The Mexican boys reached the landing shortly after I did, subdued and without game. I think I was not alone in my feeling of primitive awe in that eerie forest, the farthest outpost of somber northern forces engaged in this still undecided frontier war.

The pine groves of Cedros, in black (black spot on northeast shore is a light). This Pacific outlier of peninsular Baja California runs 30 miles from north to south. (Part of H.O. Chart 1193.)





**W**ITH THE COMING of the winter season, nights are long. A star gazing session can begin as early as 5:30 in the evening, and last until 6:30 the next morning. And after a clearing storm the air is exceptionally transparent, so that the stars seem extraordinarily bright. If one can stand the chilly air — it's not too bad in California's wintertime! — there are many fine constellations to be found. Some, like Orion and his dogs, are unsurpassed for sheer beauty.

Our chart shows the brighter stars and the outlines of the principal constellations to be seen at the times noted in the margin. The map is designed for a latitude of 40° north, but is useful within 10° on either side. Eight points on the horizon are designated (north, northeast, etc.) and the chart should be held with the corresponding label at the bottom when the observer faces a given direction. For example, facing north and at the same time holding the chart with "Northern Horizon" at the bottom, one can note the position of the star *Polaris*, and the Little Bear extending downward. The star map may also be held overhead; when properly oriented it then represents the entire sky at once, but is a bit awkward to use in this position.

"Star gazing" is one of man's oldest hobbies. In ancient times a great deal of ritual and ceremony were connected with the constellations, for in many cases their outlines were associated with deities. Also, the rising and setting of certain stars in the morning or evening twilight, together with the changing aspects of moon and planets against the starry background, heralded the coming of certain seasons and the passing cycle of time. There are many references to this sort of thing to be found in Greek and Roman literature.

Hesiod (9th century B.C.) in his "Works & Days" wrote out directions for farmers and sailors. A few quotations will illustrate the practical value of knowing the stars in an era when there were no printed calendars.

When the Pleiades are rising [i.e., in the morning twilight] begin your harvest, and your plowing when they are going to set. Forty days and nights they are hidden [i.e., in back of the sun] and appear again as the year moves round, when first you sharpen your sickle. . . . When the Pleiades, fleeing from the mighty strength of Orion, fall into the murky sea, the sailing season is over. . . . But when Orion and Sirius are come into mid-heaven and rosy-fingered dawn sees Arcturus, cut off all the grape clusters and bring them home. . . .

For these directions to be useful, one must know that they refer to the pre-dawn sky (or some specified time of night). Otherwise it is all meaningless, because the stars are continually "rising" and "setting." Only in their apparent relation to the sun is there any connection with the passing seasons. Finally, it should be noted, the slow wobbling motion of earth's axis — known as *precession* — changes these relationships around a cycle of 26,000 years. The sun's seasonal po-

sition relative to background stars continually shifts to the west. Thus Hesiod's observations, dated 28 centuries back, cannot be expected to check with our present calendar unless a correction for precession is applied. Conversely, a comparison of ancient and modern observations of this sort often makes it possible for the astronomer to assist the archeologist in dating the remains of a past civilization.

The Greeks took over the star lore of Asia Minor; the valleys of the Tigris and Euphrates may have been the cradle of "astro-nomy," or "star-naming" in western civilization. Astronomy and astrology inevitably were closely associated in ancient times, because of primitive belief in the all-pervading influence of heavenly bodies upon earthly events. Astronomy has long since cast off these superstitions, yet astronomers still use the constellations as rough, but often convenient, designations of position on the sky.

Before considering some of the constellations in more detail, a word about the planets now visible: The brilliant *Venus* is in the west just after sunset; it is so bright that it cannot be confused with a star. It usually shines with a steady light, but may sometimes twinkle if viewed low on the horizon when our atmosphere is disturbed. *Jupiter*, almost as bright as Venus, is now in the constellation Leo, near the star Regulus. During January this planet will be in *retrograde motion*, i. e., moving *westward* through the constellation.

Now, facing northwest and holding the chart before us, we note the bright star Deneb. It is located in the tail of the swan, Cygnus, which is now mostly below the horizon. It is the last of the so-called "summer stars" to disappear.

The Milky Way extends vertically from Cygnus, up through Cassiopeia, and to Perseus directly overhead. Then its course runs through Taurus, Orion, and Canis Major. The Milky Way is faintest in Taurus; this is the direction away from the center of our Galaxy and therefore we are looking through a comparatively short distance before emerging into the emptiness of extragalactic space. By "comparatively short" is meant 20,000 light-years; but then this must be contrasted with the 80,000 light-years that would be required to traverse the distance to that edge of the Galaxy lying on the opposite side of the center (beyond the constellation Sagittarius).

Facing west, we note the great square of Pegasus just above the horizon. Extending a line upward from the topmost corner, we pass to the left of the famous nebula in Andromeda. This faint, oval patch of light can be seen without a telescope on a clear, moonless night, away from the glare of city lights. A pair of binoculars renders it clearly visible. The nebula is really a great galaxy of billions of stars, entirely separate from the swarm of stars to which our sun belongs. In fact it is so separated from us that its light requires



2,000,000 years to get here (1 light-year equals nearly 6 trillion miles). This is the most remote object visible to the unaided eye.

The star Algol, in Perseus, is a very interesting object. Arabian astronomers, identifying it with the Greek Medusa, thought it a thing of evil; hence "El Ghoul" or "the Demon Star." Actually we witness a stellar eclipse; when the lesser component passes in front of the brighter the combined light is reduced to  $\frac{1}{3}$  of the normal value. This occurs every 2 days, 20 hours, 49 minutes, on the dot. It requires 5 hours for the light to fade to its minimum and another 5 hours to return to normal. On December 14, at 10:30 P.M., Algol will be in mid-eclipse; therefore from 5:30 on the star will gradually fade.

But the greatest glory of the winter sky is Orion,

the Hunter, followed by his two dogs. This region of the sky is noted for the concentration of brilliant stars and extensive nebulae. Betelgeuse, a deep red, is a giant star. It outshines the sun at least 1,200-fold and its diameter is nearly 300 times as great (i. e., approximately 250,000,000 miles). Rigel, at the opposite corner, is a blue-white star, sparkling like a diamond. While it is not such a giant in respect to diameter, its luminosity is tremendous; it outshines the sun 20,000 to one. Rigel, according to present cosmological theories, is a very young and spendthrift star — probably not more than one million years old. By contrast, the age of our mature sun must be not less than five billion years.

The three stars in Orion's belt are extremely hot — 45,000° F. as compared to our sun's mere 10,000° F.

## REVIEWS

### The stars for all ages

Three astronomy books are presented here to satisfy the curiosity of — first, the youngster in the upper elementary grades to whom “space” is a word charged with wonder and excitement; second, adults of all ages who want to learn the constellations and guide their explorations of the heavens via field glasses or a small telescope, without delving into technicalities; third, those who wish to gain a more systematic knowledge of astronomical science but lack the mathematical background required of the college astronomy student:

**The Golden Book of Astronomy.** By Rose Wyler and Gerald Ames. Foreword by Bart J. Bok. Simon and Schuster, New York. 1955. 97 pp., profusely illustrated in color; 4 star maps in end papers. \$3.95.

This book should bring joy to the hearts of many children, relief to their frantic parents and teachers. For here, in one beautifully illustrated book with large pages (10x13 in.) and easy-to-read type are the answers to almost any question a child might ask about the physical universe. From such elementary questions as “Why don’t the Australians fall off the bottom of the world?” to more profound matters such as “How far away is the farthest galaxy?” the field is covered in clear language which should reach the bright, inquisitive 4th or 5th grader. Older children will, of course, get proportionately more. And one of the most satisfying things about the book, to this reviewer at least, is that the facts are straight and the concepts (theories, ideas, and what have you) are so expressed as to start young minds on the way to scientific thinking.

The whole realm of astronomy is covered: earth and such practical matters as time and tides; the moon; the sun; the rest of the solar system. There is a chapter on the origin of the planets which presents past and current hypotheses of cosmology. The title of this chapter is “Creation,” and should be welcomed by many teachers of Sunday school. Stars, nebulae, and galaxies provide material for some of the most striking illustrative material this reviewer has seen. Finally, some chapters dealing with the problems that will have to be solved before man conquers space should come as a welcome antidote for some of the less responsible ma-

Below the belt of Orion is the sword, wherein we find the famous great nebula. This is just visible to the unaided eye on a dark night. It consists of a vast cloud of interstellar dust and gas; this is literally the stuff that stars are made of.

On a line extending the belt downward we find the brightest star of all — not intrinsically, but apparently. Sirius is only about 25 times as luminous as the sun, but at a distance of only nine light years it seems to outshine all other stars.

A pair of binoculars can add a great deal to enjoyment of the heavens. Go out some moonless night and look at Cassiopeia, Perseus, and the region between them. Admire the Pleiades and Hyades, around Aldebaran in Taurus. And most of all, take a good look at Orion’s belt and sword.

L.E.S.

terial on the subject being vended these whooping days.

There is a delightfully written foreword by the eminent astronomer Bart J. Bok, of Harvard College. It serves as a curtain-raiser on the great adventure in store for whoever opens this superbly written and illustrated book. L.E.S.

**Field Book of the Skies.** By William Tyler Olcott; revised and edited by R. Newton and Margaret W. Mayall. G. P. Putnam’s Sons, New York. 1954. xi + 482 pp., line diagrams, 18 appendices. \$5.00.

The first edition of this book appeared in 1929, and went through two more editions before the present revision was published last year. *Field Book of the Skies* has enjoyed a very great popularity, and justly so. Its plan is unique and very effective; each constellation is taken separately and considered under three headings. First, by reference to a star or stars previously described, the reader is told how to find the star group. Starting with the Big Dipper, one is led from group to group until the whole sky is covered. Constellations are divided into four groups, according to their visibility in the evening sky of spring, summer, fall, or winter. Each seasonal group is preceded by a map of the visible sky. These maps are designed specifically for latitude 40° north, but are useful within 10° of that parallel — in other words, all over the U.S.A. or anywhere in the world within the corresponding range of latitude.

The second section devoted to each constellation gives its mythology; several versions from different lands are usually given. This will appeal particularly to leaders of scout and campfire groups who are often called upon to know the “stories of the stars.”

Finally, the various points of interest — from a purely astronomical view — are presented. This includes double stars, clusters, nebulae, etc. to be seen with the unaided eye, field glasses, or small telescope. This feature of the book is particularly valuable to the serious amateur astronomer who has a telescope in his backyard.

The revised edition has eliminated many errors and ambiguities; the charts have been redrawn and are much clearer. A few misprints and errors persist; this is regrettable but probably unavoidable. All half-tone reproductions have been omitted in the new edition. This is no great defect, as good reproductions are readily available in other books. But it would have added to the usefulness of the eight maps of the moon if corresponding direct photographs had been set opposite each.

All in all, the revision of W. T. Olcott’s justly famed handbook of star gazing has been well carried out, and the result is still to be recommended as one of the best in its field. It will continue to be the favorite of many, including this reviewer.

L.E.S.

**Introduction to Astronomy.** By Cecilia Payne-Gaposchkin. Prentice-Hall, New York. 1954. x + 508 pp., illustrated. \$8.00.

There are about a dozen textbooks on astronomy at the college level currently in print; each is written by an expert in research, or teaching, or both; each generally has some good points to recommend it. It is not always easy, therefore, to point out features that make a particular astronomy textbook outstanding, though each will have its champions in the classroom. But Dr. Payne-Gaposchkin’s latest book makes that part of the reviewer’s task easy — granting

certain premises to begin with: First, both the average student and the general reader need something between the mathematical approach and that of extreme popularization — something to tell the “how and why” of astronomy. Second, the impact of astronomy upon the history of science, as well as upon philosophy and literature, is of great significance in any account of human progress.

On the score of presenting the methods and results of astronomical research with a minimum of formulae, Dr. Gaposchkin has done very well. On a quick run through the 500 pages, this reviewer counted only 25 formulae. Most of these were found in the section on the physics of the stars — a subject the average person might wish to pass up on the first reading! The book abounds in excellent diagrams and graphs, some of which this reviewer has not seen before in a book designed for the layman. The half-tones are in general excellent, though a bit more care might have been taken with the otherwise fine selection of planetary views — mostly from the Lowell Observatory.

The book is devoted about equally to the solar system and the stellar systems outside. This provides a good balance. Dr. Gaposchkin is a specialist in stellar astronomy at Harvard University, — particularly interested in the physics of stars and stellar variability. In this field she writes with authority. The chapters on galaxies and evolution are particularly worthwhile, as they bring the reader up-to-date on very recent astronomical discoveries.

Problems and review questions based on each chapter are considerably placed in an appendix, where they will not distract general reader or average student. L.E.S.

### Walking into oblivion?

**The Beast That Walks Like Man.** By Harold McCracken. Hanover House, Garden City, New York. 1955. 319 pp., illustrated. \$4.50.

It is a rather amazing coincidence when two books about the same animal appear within a few months of each other. This so happened in 1955 when *The Beast That Walks Like Man* by Harold McCracken and the *California Grizzly* by Tracy I. Storer and Lloyd P. Tevis, Jr. both were published. While there is bound to be a certain amount of duplication under these circumstances these two works in many respects complement one another. Storer and Tevis concentrated their efforts on the history of the grizzly in one state where incidentally, not much more than one hundred years ago, it was more abundant than anywhere else in the nation.

In Harold McCracken's fascinating publication the history and present status of this great carnivore on the entire North American continent is encompassed. The author is not only an accomplished writer who has chosen his facts carefully and presented them in a most interesting manner but he has acquired much firsthand information about his subject. One of his boyhood ambitions was to become a professional hunter of grizzlies, an ambition that was later fulfilled. In this instance, however, familiarity bred respect and McCracken replaced the gun with pen and camera.

In this narrative, the author gives some of his personal experiences with grizzlies, particularly on the Alaska Peninsula. Much of the book, however, relates to the early history of these animals in North America. Indian legends



as well as the relationship that these native inhabitants had with “the beast that walks like man” provide very fascinating reading. Equally interesting are accounts of the early explorers' contacts with the grizzly, including those of Lewis and Clark who collected the first scientific specimen of *Ursus horribilis*, later described by George Ord. Other famous frontiersmen whose experiences with these bears help to complete the story include Jedediah Smith, Kit Carson, and Jim Bridger.

The appendix contains a list of source material which provided the data for each of the chapters. This is followed by a check-list of the grizzly and big brown bears of North America based upon the classification proposed by C. Hart Merriam in 1918. R.T.O.

**California Grizzly.** By Tracy I. Storer and Lloyd P. Tevis, Jr. University of California Press, Berkeley and Los Angeles. 1955. xii + 335 pp., 36 figs., colored frontispiece, maps. \$7.50.

In the *California Grizzly* Tracy I. Storer and Lloyd P. Tevis, Jr. have contributed immeasurably to our knowledge of an animal whose name is familiar to every school child but which will never again be seen in the wild in the state that long ago selected it as its emblem. To write an authoritative account based largely on historical documents, old newspaper reports, anecdotes handed down by word of mouth, museum records, and other such media requires skill and judgment. Facts must be separated from fiction.

In the reviewer's opinion the authors have satisfactorily met those challenges and produced a book which will prove of lasting value not only to zoologists but also to anthropologists and students of California history.

The material is arranged in a logical order that tells us of the past distribution of these bears, their relationship to other species of bears living today, and such information as can be ascertained on the former habits of the grizzly in California.

The next several chapters tell of the relationship of grizzlies to the various groups of human occupants of the state as they succeeded one another — first the Indians, next the Spaniards, and finally the Americans.

The Indians feared the bears and tried to avoid them although they were competitors for food such as berries, nuts, roots and even game. Sometimes bears were killed for food and for their hides and occasionally Indians were killed by bears. Neither species had a great effect on the population of the other.



With the settlement of California by the Spaniards great herds of cattle and horses made their appearance. These provided the grizzly with an additional source of food. Although the bears were sometimes shot or even roped by the Spaniards, who were not hunters by nature, their number seemed to increase. The pursuit of grizzlies with a lariat was a favorite sport although a risky one. Another form of excitement which appealed greatly to the temperament of the Spanish settlers was to stage a fight between a bear and a bull. This was a common form of amusement in most of the early California settlements but it had little effect on the numbers of those big carnivores.

It remained for the American settlers and the great demand for meat in the days of the Gold Rush to reduce the grizzly population to the point of no return. Whereas the Spanish killed in self-defense or to protect their herds or occasionally for sport, the market hunters in the middle of the 19th century killed for profit. In 1899 the meat of one grizzly alone is reported to have netted a hunter about \$1,300. The fat and hides also had a market value. From an estimated population of 10,000 grizzlies the number declined rapidly. Continued settlement and development of the land made inevitable the extinction of a species that was not particularly compatible with man. Fifty years after the Gold Rush these animals were rarities in the State and by the 1920's the last one had disappeared.

No text on the California grizzlies would be complete without an account of the adventures of James Capen Adams, better known as Grizzly Adams. Much of the information given comes from Theodore H. Hittell's famous work on this mountaineer, bear hunter, and showman. It is quite fitting that the many and varied experiences of Adams and some of his friends, such as the "distinguished native Californian" Ben Franklin, a trained grizzly, be included.

This fascinating and thoroughly documentary work concludes with a list of all known specimens of California grizzlies, their present location, a complete list of source material, and bibliography. There are a number of illustrations that have been carefully selected. Some represent recent grizzlies from other parts of North America to show the characters and habits of the species. Others represent old drawings, bear posters, and famous California grizzly paintings including "Return from the Bear Hunt" by William Hahn, presently on exhibit in San Francisco at the M. H. de Young Memorial Museum. There is also a colored reproduction of the official Bear Flag adopted by the California Legislature in 1953 and designed by Don Greame Kelley, editor of *Pacific Discovery*. R.T.O.

#### Edge of the sea around us

**The Edge of the Sea.** By Rachel Carson. Illustrated with drawings by Bob Hines. Houghton Mifflin Company, Boston. 1955. 276 pp. \$3.95.

In her latest book Rachel Carson has returned to the shores of the sea, where she started out with her first book, *Under the Sea Wind*. This, however, is a much better book. It concerns the three types of shorelines of the Atlantic coast, from rock-bound Maine, along the sandy Carolinas, to the coral coast of Florida, and the plants and animals characteristic of the intertidal and shallow waters of each of these three coastal types. Unfortunately the Gulf coast is not included, but in spite of this omission, the book is a

fine introduction to the seashore that will entertain many readers, and should inspire some to become naturalists (although a brief bibliography would have enhanced the value of the book for this purpose). As would be expected from the geographical limits of the book, there are very few references to the Pacific coast, and it is therefore regrettable that one of those few references repeats the implication that our giant kelp is usually 150 feet long when half that length is nearer the truth.

So many books have been written about the seashore and its life that it is difficult to say anything new or to approach the subject with a fresh philosophy. It cannot be said that Miss Carson has made an original approach, but she has managed to convey the freshness of her own experience, which is the important thing. She has also achieved a nice blend of the physical environment and the organic life not often found in a book primarily intended to be reading matter, as opposed to a conventional field guide. Nevertheless the armchair reader (whoever he may be) may find that there is too much detail about animals for uninterrupted reading.

The illustrations are excellent, with a well rounded, delicate finish that nicely complements the text. There is a short appendix on the classification of plants and animals, and an index including scientific names as well as subject matter.

JOEL W. HEDGPETH

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#### Earth and universe in graphic design

*Reading Pacific Discovery, or many of the books reviewed here, is armchair exploration and of course calls for an atlas at the elbow. We are grateful for atlases — they save us a good deal of map work this magazine would otherwise need, to help you get the most out of its articles. Here is one nearly ideal for our uses:*

**The Columbus Atlas, or Regional Atlas of the World.** Designed and edited by John Bartholomew. John Bartholomew & Son Ltd., Edinburgh; McGraw-Hill Book Company, Inc., New York (1955.) viii + 160 pp. of maps + 137 pp. General Index. \$10.00.

Hondius, Blaeu, Ortelius, Mercator — the early European explorers sailed by their charts and brought back the stuff of new ones. Modern cartographer but inheritor of a great tradition is John Bartholomew of Edinburgh. A map or atlas with his imprint may be taken, for its date, as authoritative summation of the knowledge it represents. The present volume (a comfortable 8¼ x 11 inches and not heavy) is what an atlas should be — a book of maps, plus the necessary complete index of places found on them. Which is why it is ideal for the armchair explorer — he is not burdened with the extras that do sometimes (often properly) go with an atlas. Most atlas users are familiar with the finely wrought Bartholomew engravings: the relief in green and brown layer tints, the wealth of cultural detail besides. Following the regional maps, there is a slim section of exquisitely scaled world maps of population, the physical world on a pole-centered butterfly projection, climate, natural vegetation, soil, land use, communications, temperature, winds, airways — the information needed for general science reading. A great small atlas! The ship, opposite, sailed off the title page, thanks to McGraw-Hill.

**Design of the Universe: The Heavens and the Earth.** By Fritz Kahn. Crown Publishers, Inc., New York. 1954. x+373 pp., 150 illustrations. \$5.00.

This is a one-volume encyclopedia of the cosmos in four parts: The World of Modern Physics, The Atom, The Heavens, The Earth. Not only does it sum up for us the latest thinking on each subject, it shows by what historical route we got to our present stage of knowledge. Leaving astronomy to our friends of the Morrison Planetarium and speaking to our own interests: two features of *Design of the Universe* specially please us — the generous space given *Earth*, its structure, surface, atmosphere; and the absolutely magnificent diagrammatic drawings which make difficult concepts graspable. Finally, we like the closing plea for conservation of this living skin of earth on which our own life so utterly depends.

### World of mammals

*Intense interest in the life of land and sea around us is repeating today the history of a century ago and publishers have risen nobly to the challenge. Here are, not one, but two books of Earth's mammals almost identical in format to the big Birds of the World by Paul Burrell (Oxford) reviewed last issue:*

**Living Mammals of the World.** By Ivan T. Sanderson. Hanover House, Garden City, New York. 1955. 303 pp., 140 halftones, 190 full-color photographs. \$9.95.

**Mammals of the World: Their Life and Habits.** By François Bourlière. Alfred A. Knopf, New York. 1955. 223 pp., over 200 photos (24 in full color), 34 line drawings. \$12.50.

These two equally handsome presentations of the world's mammals were published almost simultaneously, hence they inevitably invite comparison through joint review. We don't intend that one should come out apparently ahead of the other. Many, for their purposes, will want and should have both; price will force most to settle for one — which one is reader's choice. Both authors are highly qualified; Sanderson is the better known to readers in English because Dr. Bourlière only recently "arrived" among us in translation (*The Natural History of Mammals* [Knopf, 1954] was reviewed here Sept.-Oct. 1954). The Englishman has long enjoyed popular recognition through his books on both sides of the Atlantic; the Frenchman, however, is well recognized among his zoological colleagues internationally, while his two books which we now have put him in top rank among writers for the educated layman.

Sanderson's present book is based on accepted classification of the world's mammals by order and family, necessarily simplified to fit his format. Bourlière takes the ecological approach via major world habitats — the tropical forests, savannah and desert, temperate forests and prairies, the "great north," the mountains, and separately the aerial and aquatic mammals. Both authors introduce their subject with general considerations. Most of Sanderson's photographs are from zoos; most of Bourlière's, from the wild. Both use the work of the world's best animal photographers. Reproduction in both books is very good; but there is more need in Sanderson's to correct mentally for color — some plates are over-red, some over-blue. Bourlière's on the whole come truer to life, it must be said. In any case, it is well to examine both these fine books before buying.

**The Book of Beasts: Being a translation from a Latin Bestiary of the Twelfth Century.** Made and edited by T. H. White. G. P. Putnam's Sons, New York. 1954. 296 pp., profusely illustrated. \$7.50.

If you want to see how far we have come in zoological science, compare this quaint volume with the mammal books by Sanderson and Bourlière. This is no invitation to laughter. Rather, it is good in such matters to see and appreciate what went before. The cave hunter knew animals — those he hunted, at least — and drew them tellingly. It is a curious fact that, in the process of getting civilized, man forgot for centuries on end to observe nature simply and directly. About animals, for instance, he built up a body of lore — fact and fancy, often more of the latter — which got retold, and set down in books. So men went to books rather than to the woods and fields. There grew a long line of books about beasts and other marvels, which were copied and miscopied, usually with the copyer's own additions. By the 12th century of our era the thing had really flowered, complete with much moralizing.

There are many reasons why it is worth while to recreate a 12th century bestiary today. It is entertainment for some, a source book of earlier knowledge and beliefs for others. The present rendering is in modern English, but the illustrations are right out of the old manuscript. Interest in the history of science is sufficient reason for Mr. White's well done presentation, to which he has appended a thoroughly readable history of bestiaries, and a very considerable bibliography.

### Bird Portraits

**Mr. Gould's Tropical Birds: comprising twenty-four plates selected from John Gould's Folios together with descriptions of the birds taken from his original text edited and introduced by Eva Mannerling.** Crown Publishers, New York. 1955. xvi pp., 24 full-color plates. \$7.50.

Here in 12 by 16-inch format, and at a price made possible by European printing, is a sampling of the life-work of a remarkable English counterpart of Audubon, John Gould. Living from 1804 to 1881, Gould traveled the world from the Andes to the Himalayas and to Australia for the collections and sketches that enabled him, with his wife and a corps of other artists doing the finished work, to publish 2,999 paintings of birds, besides Australian mammals. What is more, he made money from his chosen work, even while earning the right to be called naturalist as well as publisher. The great folios on the natural world, so laboriously produced from the lithographer's stone, once graced the more elegant 18th and 19th century homes. Modern reproduction methods give us satisfactory samples.

### 30,000 miles of nature

**Wild America: The record of a 30,000-mile journey around the continent by a distinguished naturalist and his British colleague.** By Roger Tory Peterson and James Fisher. Illustrated by Roger Tory Peterson. Houghton Mifflin Company, Boston. 1955. xii + 434 pp. \$5.00.

When two jovial bird men, armed with cameras and the ability to write wisely and entertainingly about birds and everything else they meet with, join forces in Newfoundland, fly to Boston, drive to Key West and around the Gulf, deep into Mexico, through our Southwest to San Diego, and on up to Seattle to fly to Alaska, winding up



in the Pribilof Islands in the Bering Sea — well, the resulting book mixture is bound to have something in it for everybody, not only other bird men. Your reviewer, for instance — no bird man — has read few books keeping him in so high a pitch of sustained delight or inciting him with such zeal to urge it on others.

These two irrepressibles kick their narrative back and forth between them smoothly, slip occasional sly footnotes into each other's copy, and have a ripping good time taking you and each other on a bully good trip. James reacts to his first view of the American continent with hearty and sincere appreciation. Roger planned the trip with consummate skill in timing, almost literally to the hour of a given Tuesday when a certain bird would wait on the third branch up a designated oak *x* miles from — etc., — until England's top bird watcher gasped at his American opposite number's mastery of bird ways. What thrilled James most was the extent of America's surviving heritage of wildness; he flew home elated that here still exists what Europe has largely lost. Of course there is a closing prayer that we'll not lose it yet through complacency. (They searched in vain for just one ivory-billed woodpecker in the last known haunt of the species. But they wound up with a new record of number of species seen in America in one year.) Roger Peterson's scratchboard drawings from photos put him among our best black-and-white nature illustrators and cap a charming book.

#### Art through the ages

*Art belongs to the natural history of man as surely as hunting habits, agricultural methods, or tool-invention. The fact is at once recognized in anthropology and ethnology and becomes basic in the study by these sciences of so-called primitive man. A book such as this is equally necessary to the student of man and the student of art:*

**Primitive Art.** By Erwin O. Christensen. A Studio Publication. Thomas Y. Crowell Company, New York. 1955. 384 pp., 31 full-color plates, 348 halftone figs., 49 line illus., maps. \$15.00.

"Primitive art is produced by people who have not developed any form of writing," the author of *The Index of American Design* defines his present subject. "The word 'primitive' applied to art commonly means Negro African sculpture, aboriginal American art, the arts of the South Seas, and other tribal arts in different parts of the world." And Erwin O. Christensen's bounds will hold at least in the "art world"; science thinks in terms of "material culture." Both views respect art on this plane as expressing the creator's social context above his merely personal bent.

Having reviewed here such regional surveys as *Native Arts of the Pacific Northwest*, *Art of the Northwest Coast Indians*, *The Eagle, the Jaguar, and the Serpent*, *Arts of the South Seas*, and *Art in the Ice Age*, we find great pleasure in presenting now a magnificent single volume which embraces all the recognized groupings that partake of the idea "primitive art" as here defined. It does not eliminate the specialist's need for what interests him most among dozens of others; but it enables one with general interest to get the cream of the whole at moderate cost. The pictures are virtually a guide to every notable collection, and the text should satisfy any general reader. This is the gift for the serious art student on your list.

**Unesco World Art Series: Vol. IV. Yugoslavia: Mediaeval Frescoes.** Preface by David Talbot Rice. Introduction by Svetozar Radojcic. The New York Graphic Society (by arrangement with Unesco), Greenwich, Conn. 1955. 30 pp. + 32 full-color plates, 13 x 18¾ inches. \$15.00.

From the cave paintings of Altamira and Dordogne to the frescoes of medieval churches is a long way in the history of art and of man; yet the difference between the two is not one of kind but only of time and technique. Man became artist when he became man, speaking broadly. Artisan first, if you will — he made things for use; decorating them, he became artist. In the cave paintings we see his response to mystery, his reflectiveness on the world and life, his recognition of the supernatural. There is no essential difference between those earliest murals we know of and the paintings beneath the pyramids or the frescoes that cover wall and ceiling of medieval church and monastery. They are all man's highest expression of, his uttermost response to, whatever is deepest within him.

In the Unesco World Art Series, the publisher is giving us in magnificent reproduction and at moderate cost, the record of this highest expression. It appears here and there in time and in place; but whether in India's Ajanta Caves, on the rock cliffs of Arnhem Land (the *Australia* volume of this series, already published, will be reviewed in the forthcoming special *Australia* issue), or, as recently disclosed, within early Christian edifices of Yugoslavia and other parts of the Balkan peninsula, the thoughtful will see Man speaking, Man bowing to the infinite, with dedication to the highest he knows in his time. Volume IV is a tremendous addition to the published records of world art.

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Drawing by Roger Tory Peterson for *Wild America*.  
(Courtesy Houghton Mifflin Company, Boston)



### Early American fixtures

**The Living Past of America: A Pictorial Treasury of our Historic Houses and Villages that have been Preserved and Restored.** By Cornelius Vanderbilt, Jr. Crown Publishers, Inc., New York. 1955. xiv + 234 pp., hundreds of photographs. \$5.95.

For the person interested in American history (and who isn't?), for the high school youth with a growing appreciation of our traditions and heritage, this portfolio of photographs with descriptive text will make a fine gift. It is also a guidebook to the nation: for each subject there are road directions, hours open, and admission fees. It has "the first and only full National Directory of Historic Preservations ever compiled," state by state.

Note for the next edition: Fort Ross on the California coast is not at Cazadero, the post office is miles inland.

### "Early California Travels"

*A possibly impractical but bibliographically important and personally gratifying task of your editor has been the reporting of the Early California Travels Series published by Glen Dawson of Los Angeles. In this issue two years ago we noted numbers V through XVII of this meandering stream of small and varied and — in format and content — consistently lively collectors' volumes. The brothers Dawson — Glen, expert in Western Americana, and Muir, himself a printer, historically sage in the typographic art — have found the venture rewarding, in a business way we trust for Dawson's Book Shop, and certainly in the satisfaction of putting into attractive and permanent form some hitherto perishable records of our Californian beginnings. Imprac-*

*tical it may be here, only because the issues are likely to be subscribed out of print as fast as they appear! — a tribute to their intrinsic worth.*

**Early California Travels Series.** Glen Dawson: Los Angeles, 1953-1955.

**XVIII. A Voyage on the Colorado — 1878.** By Francis Berton (Corresponding Member of the Geographical Society of Geneva). Translated and Edited by Charles N. Rudkin. 1953. 103 pp. Notes and Bibliography. \$7.50. Up river 200 miles from Yuma, by steamer.

**XIX. The Mormons in California.** By William Glover. Foreword, Notes and a Selected Bibliography by Paul Bailey. 1954. 40 pp.

**XX. The First American Vessel in California: Monterey in 1796.** By Henry R. Wagner. 1954. 33 pp. Notes.

**XXI. Snow-Shoe Thompson: 1856-1876.** By Dan De Quille. Preface by Carroll D. Hall, Curator at Sutter's Fort State Historical Monument. 1954. xv + 63 pp.

**XXII. Vancouver in California, 1792-1794: Maps and Illustrations.** Index compiled by George Shochat for the Marguerite Eyer Wilbur edition of the original account by George Vancouver. Volume III. 1954. 16 plates, 8 pp. index. The text of 274 pages appeared in 2 volumes as nos. IX and X of the Series, 1953 and 1954, subtitled: *The original account of George Vancouver. This edition of "only the California portions" of Vancouver's Voyage of Discovery to the Pacific Ocean, etc. (London, 1798) is undoubtedly one of the most important titles in the present Series.*

**XXIII. Camille de Roquefeuil in San Francisco, 1817-1818.** By Charles N. Rudkin. 1954. x + 83 pp., notes. Again, the California portions of a voyage around the world.

**XXIV. Franciscan Missions of Upper California as seen by Foreign Visitors and Residents: A Chronological List of Printed Accounts 1786-1848.** By Willard O. Waters. 1954. (50 pp.)

**XXV. Visit to Monterey in 1842.** By Dr. R. T. Maxwell. Edited by John Haskell Kemble. 1955. 40 pp.

**XXVI. Job Printing in California.** By Ward Ritchie. With four original examples of early California printing. 1955. 31 pp. Inclusion of this item, by one of California's leading present printers, dealing with the 35 years after the arrival of California's first printer, Zamorano, in 1825, may be justified by the fact that printers in those days were notoriously peripatetic!

**XVII. The Russians on the Pacific Ocean: [California, 1845].** By Alexander Markoff. The Ivan Petroff translation with a Foreword by Arthur Woodward. 1955. xvii + 65 pp. \$5.00.

**XXVIII. Letter From San Jose, California, March 18, 1848.** By Charles White. Introduction by Carey S. Bliss. 1955. 8 pp.

**XXIX. Glances Into California.** By Walter Colton. Introduction by Edwin Corle. 1955. xxv + 43 pp. \$10.00. The namesake of Monterey's famous Colton Hall left another lasting monument, his book *Three Years in California*. The present title is the closing chapter of another Colton book, *Deck and Port*, which is "difficult to find today." The selection deals with the years 1846-49.

**XXX. Floating on the Pacific Ocean (Hyoryu Ki).** By Hikoze. Translated from the 1863 edition by Tosh Moto-fuji. 1955. xii + 89 pp., illustrated. \$7.50. Adventures of a Japanese castaway brought to San Francisco by an American ship.

**XXXI and XXXII** are in preparation; **XXXIII** is already out of print, will be saved for our next Series roundup.



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#### Errata

September-October—page 32: The price of *Doctor to the Islands* is \$4.50, not \$5.00. Apologies to Little Brown & Company for our failure to take prompt note of their correction card mailed to us.

No other errors worthy of note have come to our attention. Doubtless they will come out of hiding after this is committed to press.



**The Wanderings of Edward Ely: A Mid-19th Century Seafarer's Diary.** Edited by Anthony and Allison Sirna. Hastings House, New York. 1954. 217 pp. \$3.75.

In 1850 a 23-year-old Pennsylvanian physician, ailing, got himself appointed U.S. Consul to Bombay, hoping a sea voyage and tropical service would restore his health. He shipped February 1, 1951, from New York on the sailing ship *Delia Maria* for San Francisco around the Horn. This is his diary, begun in New York while waiting to sail. An intellectual with a strong sense of duty to family and fellows, he turned to, to work the undermanned ship, and thereby regained his strength. With the captain drunk and mates sick, he brought the *Delia Maria* around the Horn in terrible weather. Young Ely spent many months in San Francisco and central California; served as officer on a steamer to Panama and return; finally got passage to India by way of Honolulu.

We have many sea-journals of those days, many accounts of life in our state in its first years, many vivid pictures of San Francisco a-borning. But Edward Ely's is not just one more. It must stand among the best on all counts. Young Ely experienced life intensely, yet reflectively; he put himself and others on paper with an unstudied clarity, moving eloquence, and sure—even sometimes robust—humor that ring together as style. He died of dysentery at 31.

**Capricorn Road.** By François Balsan. Translated from the French by Pamela Search. Philosophical Library, Inc., New York. 1955. 252 pp., 16 photos. \$4.75.

Four years ago the Panhard-Capricorn Expedition, six Frenchmen and three South Africans, crossed South Africa, ocean to ocean, in the latitude of the Kalahari Desert, one of the little explored land areas of the world. The leader, a geographer and explorer, provides us with a very lively narrative, dwelling long over the troubles they had with their two 10-ton diesel trucks in roadless country. There is much about the bushmen and other still uncivilized tribes, about the search for a hypothetical "lost city" and the finding instead of scattered stone-age artifacts, and about the people and life of remote but hospitable ranches. Scientifically at least, the climax of the book is the discovery of some rock paintings which may be 7,000 years old and related to those found in the Saharan massifs. Otherwise, little is told connectedly or conclusively about the scientific results of a spectacular venture. It is well therefore just to enjoy *Capricorn Road* as a good exploring narrative—but you will look in vain for the map the book needs.

**Garden Spice and Wild Pot-Herbs.** By Walter Conrad Muenscher and Myron Arthur Rice. With illustrations cut on wood by Elfriede Abbe. Comstock Publishing Associates, a division of Cornell University Press, Ithaca, New York. 1955. 211 pp., glossary and index. \$5.75.

An authoritative compendium of botanical information which is at the same time a planting manual, this is for the herb enthusiast—gardener or user. Common English, French, German, and Italian as well as scientific names are given—a help in ordering seeds and bulbs from catalogs—and there are observations on medicinal and culinary uses. The drawings are crisply detailed. In an effort to recreate the appearance of the old herbals, we suppose, the type, apparently selected by the artist, is absurdly large and bold. A *typographer* should have been consulted! Nevertheless, this will make a handsome gift book.

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